

July 26, 2022

OFFICIAL RESPONSE TO SIGNIFICANT ENVIRONMENTAL POINTS RAISED DURING THE TIMBER HARVESTING PLAN EVALUATION PROCESS

FROM THE DIRECTOR OF THE CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION (CAL FIRE)

TIMBER HARVESTING PLAN (THP) No:
SUBMITTER:
COUNTY:
END OF PUBLIC COMMENT PERIOD:

DATE OF RESPONSE AND APPROVAL:

1-21-00199-MEN
Redwood Empire Sawmills
Mendocino
Initially April 2, 2022
Reopened from June 2 to July 5, 2022
July 26, 2022

The California Department of Forestry and Fire Protection (CAL FIRE) serves as the lead agency in the review of Timber Harvesting Plans. These plans are submitted to CAL FIRE, which directs a multidisciplinary review team of specialists from other governmental agencies to ensure compliance with environmental laws and regulations. As a part of this review process, CAL FIRE accepted and responded to comments, which addressed significant environmental points raised during the evaluation of the plan referenced above. This document is the Director's official response to those significant environmental points, which specifically address this Timber Harvesting Plan. Comments, which were made on like topics, have been grouped together and addressed in a single response. Remarks concerning the validity of the review process for timber operations, questions of law, or topics and concerns so remote or speculative that they could not be reasonably assessed or related to the outcome of a timber harvesting operation, have not been addressed.

Sincerely,

DocuSigned by:

James Strong

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James Strong
Forester II, Forest Practice
RPF #2689



cc: RPF, Unit, File; Timber Owner, Timberland Owner and/or Submitter
CP, CDFW, DPR, & RWB

<https://caltreesplans.resources.ca.gov/caltrees/caltrees.aspx>

July 26, 2022

PUBLIC NOTIFICATION

To inform the public of this proposed Timber Harvesting Plan (THP) and determine if there were any concerns with the plan the following actions were taken:

- Notification of the receipt of a timber harvesting plan was sent to the adjacent landowner(s).
- Notice of the receipt of the plan was submitted to the county clerk for posting with other environmental notices.
- Notice of the plan was posted at the Department's local office and also at the regional office in Santa Rosa.
- Notice of the receipt of the THP was sent to those organizations and individuals on the Department's list for notification of plans in the county.
- A "Notice of the Intent to Harvest Timber" was posted near the plan site.

THP REVIEW PROCESS

The laws and regulations that govern the Timber Harvesting Plan review process are found in Statute law in the form of the Forest Practice Act which is contained in the Public Resources Code (PRC) and administrative law in the rules of the Board of Forestry and Fire Protection (the Forest Practice Rules) which are contained in the California Code of Regulations (CCR).

The Forest Practice Rules are lengthy in scope and detail and provide explicit instructions for permissible and prohibited actions that govern the conduct of timber operations in the field. The major categories covered by the rules include:

- Timber Harvesting Plan contents and the Timber Harvesting Plan review process
- Silvicultural methods
- Harvesting practices and erosion control
- Site preparation
- Watercourse and lake protection
- Hazard reduction
- Fire protection
- Forest insect and disease protection practices
- Coastal Commission Special Treatment Areas
- Use, construction and maintenance of logging roads and landings
- County-specific rules

When a THP is submitted to the Department, it undergoes a multidisciplinary review consisting of several steps. In addition to CAL FIRE, the Review Team members include representatives of the California Department of Fish and Wildlife (CDFW); the appropriate Regional Water Quality Control Board (RWQCB or RWB); California Geological Survey (CGS); the Department of Parks and Recreation (DPR); the appropriate County Planning office; and if within their jurisdiction, the Coastal Commission (CC) (14 CCR § 1037.5(a)). Once submitted the Director determines if the plan is accurate, complete, and in proper order, and if so, files the plan (14CCR § 1037). In addition, the Review Team determines whether a Pre Harvest Inspection (PHI) is necessary, and what areas of concern are to be examined during the inspection (14 CCR § 1037.5(g)(1)).

July 26, 2022

If the plan is accepted for filing, and a PHI is determined to be needed, a field review is conducted to evaluate the adequacy of the THP. All agency personnel who comprise the multidisciplinary Review Team are invited to attend the PHI as well as other experts and agency personnel whom the Department may request. During this field review, additional mitigation and/or recommendations may be formulated to provide greater environmental protection. These recommendations are forwarded to the RPF along with the Review Team member's PHI Report. The RPF will respond to the recommendations made and forward these to the Region office and Second Review Team Chair.

A Second Review Team meeting is held where members of the multidisciplinary Review Team meet to review all the information in the plan, and develop a recommendation for the Director (14 CCR § 1037.5(g)(2)). Prior to and/or during this meeting they examine all field inspection reports, consider comments raised by the public, and discuss any additional recommendations or changes needed relative to the proposed THP. These recommendations are forwarded to the RPF. If there are additional recommendations, the RPF will respond to each recommendation, and forward their responses to the regional office in Santa Rosa.

The representative of the Director of the Department reviews all documents associated with the proposed THP, including all mitigation measures and plan provisions, written correspondence from the public and other reviewing agencies, recommendations of the multidisciplinary Review Team, and the RPF's responses to questions and recommendations made during the review period. Following consideration of this material, a decision is made to approve or deny a THP.

If a THP is approved, logging may commence. The THP is valid for up to five years, and may be extended under special circumstances for a maximum of two more years, for a total of seven years.

Prior to commencing logging operations, the Registered Professional Forester must meet with the licensed timber operator (LTO) to discuss the THP (CCR § 1035.2); a CAL FIRE representative may attend this meeting. The Department makes periodic field inspections to check for THP and rule compliance. The number of inspections depends upon the plan size, duration, complexity, and the potential for adverse impacts. Inspections include but are not limited to inspections during operations pursuant to Public Resources Code (PRC) section 4604, inspections of completed work pursuant to PRC section 4586, erosion control monitoring as per PRC section 4585(a), and stocking inspection as per PRC section 4588.

The contents of the THP, the Forest Practice Act, and rules, provide the criteria which CAL FIRE inspectors use to determine compliance. While the Department cannot guarantee that there will be no violations, it is the Department's policy to vigorously pursue the prompt and positive enforcement of the Forest Practice Act, the Forest Practice Rules, related laws and regulations, and environmental protection measures that apply to timber operations on non-federal land in California. This enforcement is directed primarily at preventing forest practice violations, and secondarily at prompt and adequate correction of violations when they occur.

The general means of enforcement of the Forest Practice Act, the rules, and other related regulations range from the use of violation notices, which require corrective action, to criminal proceedings through the court system. Timber operator and Registered Professional Forester licensing action may also be pursued. Most forest practice violations are correctable and the

July 26, 2022

Department's enforcement program assures correction. Where non-correctable violations occur, criminal action is usually taken. Depending on the outcome of the case and the court in which the case is heard, some sort of environmental corrective work is usually done. This is intended to offset non-correctable adverse impacts.

Once harvesting operations are finished, a completion report must be submitted certifying that the area meets the requirements of the rules. CAL FIRE inspects the area to verify that all aspects of the applicable rules and regulations have been followed, including erosion control work. Depending on the silvicultural system used, the stocking standards of the rules must be met immediately or in certain cases within five years. A stocking report must be filed to certify that the requirements have been met.

FOREST PRACTICE TERMS

CAL FIRE	Calif. Dept. of Forestry & Fire Protection	NCRWQCB	North Coast Regional Water Quality Control Board
CCR	California Code of Regulations	PHI	Pre-Harvest Inspection
CDFW	California Department of Fish and Wildlife	PRC	Public Resources Code
CEQA	California Environmental Quality Act	RPF	Registered Professional Forester
CGS	California Geological Survey	THP	Timber Harvesting Plan
DBH/dbh	Diameter at Breast Height	WLPZ	Watercourse & Lake Protection Zone
LTO	Licensed Timber Operator	TMDL	Total Maximum Daily Loads
FPR	Forest Practice Rules	MSP	Maximum Sustained Production of High Quality Timber Products
DPR	Department of Pesticide Regulation (same as CDPR)	CALTREES	CAL FIRE's publicly available online database for harvesting permits
CDPR	California Department of Pesticide Regulation	STZ	Special Treatment Zone
NSO	Northern Spotted Owl	WLPZ	Watercourse and Lake Protection Zone
CSDS	Controllable Sediment Discharge Source	BA	Basal Area
NCRM	North Coast Resource Management	SSMP	Site Specific Management Plan
ECP	Erosion Control Plan	NOI	Notice of Intent to Harvest

[sic] Word used verbatim as originally printed in another document. May indicate a misspelling or incorrect word usage

BACKGROUND

Timber Harvesting Plan (THP) # 1-21-00199-MEN "Seventh Heaven THP" proposes to harvest timber on 895 acres of The RMB Revocable Family Trust Dated February 5, 1999 timberland using the Group Selection, Selection, and Transition silvicultural methods. The THP was initially received by CAL FIRE on December 31, 2021 and returned on January 6, 2022. The plan was resubmitted on January 31, 2022 and was accepted for filing on February 2, 2022. A Preharvest Inspection (PHI) was conducted on March 2 and March 4, 2022. Attendees on this PHI included:

- Kevin Doherty (CGS)
- Kenneth Margiott (CAL FIRE Inspector)
- Adam Hutchins (CDFW)
- Ben Harris (CAL FIRE Archeologist)
- Jesse Weaver (RPF) and Clint Ducette (Forestry Technician) from Redwood Empire
- Madeline Green (RPF) and Kate Cahill (RPF) from NCRM

July 26, 2022

- Jim Burke and Justin Fitt (NCRWQCB)

The Final Interagency Review (aka Second Review) began on April 7, 2022; which generated six recommendations. The RPF responded to these recommendations on April 8, 2022. Another Second Review meeting occurred on April 11, 2022, and the Second Review Chair recommended the plan be approved. The public comment period then ended on April 21, 2022.

The initial deadline for the Director's Determination Deadline (DDD) was set for May 12, 2022 per 14 CCR § 1037.4. Multiple extensions were granted extending the DDD to June 2, 2022 to address public comments, generate the Official Response (OR) to concerns brought up by the public, and evaluate the Plan for final approval. On June 2, 2022, the plan was recirculated due to significant new information that was brought to light. One of the addresses on the NOI was incorrect. The corrected NOI was sent out and the public comment period was reopened for 30 calendar days. The revised close of public comment was July 5, 2022. The revised DDD was changed to July 26, 2022

PUBLIC COMMENT SUMMARY

During the initial public comment period for this THP as described above, there were five public comment letters (one comment was a duplicate) received at the CAL FIRE Region Headquarters in Santa Rosa. Two additional public comments were received during the 2nd public comment period. These public comments brought up concerns that are addressed in this Official Response (OR). General concerns are grouped by subject matter and followed by the Department's response. Original text taken directly from the public comment, rules, reports, or the THP are presented as italicized text. Words that are emphasized in responses have underlined font. The public comments are identified with the CAL FIRE "PC" code. A copy of the original letters sent to the Department are viewable through the Department's online Forest Practice Database CalTREES.

CalTREES instructions: navigate to <https://caltreesplans.resources.ca.gov/caltrees/caltrees.aspx> Click the search icon at the top of the page, then type the Plan # in the Record Number box (county identifier not needed). Under the Document Number column, select the Plan Number for the "Timber Harvest Plan" Type. Below the "Record Details" should be a list of attachments for the Plan. (Note: if there are a substantial number attachments, or attachments with large file sizes, it may take some time to load). The Public Comments are labeled under "Record Type" and are in pdf format, usually with a "PC" label.

July 26, 2022

SUMMARY OF SIGNIFICANT ENVIRONMENTAL GENERAL CONCERNS WITH RESPONSES

CONCERN 1: Sediment and Temperature TMDL Impacts to Garcia River Watershed.

The letter expressed concern that timber operations would lead to significant temperature and sediment impacts.

RESPONSE: Watercourses in the footprint of the THP drain to the Big River, which is 303(d) listed for sediment and temperature. The Plan proposes 283.5 acres of Group Selection, 133 acres of Selection, 96 acres of No Harvest and 382.5 acres of Transition utilizing tractor and cable yarding. Tractor yarding is limited to gentler slopes (see discussion on page 131 of the THP). The plan outlines on pages 131-133, a partial list of measures to reduce, mitigate or avoid sediment production. Sediment impacts could occur due to sediment transport from roads into watercourses, activation of slides, and disturbance of soils near watercourses. The Plan seeks to minimize the potential for these issues by:

- Requiring compliance with the Anadromous Salmonid Protection (ASP) rules which provide WLPZ buffers on all Class I and Class II watercourses and equipment limitation zones on Class III watercourses.
- Minimizing soil disturbance on steep slopes by using modern cable yarding harvest systems.
- Identifying existing and potential sediment production sites and proposing corrective action, as detailed in the Erosion Control Plan (ECP).
- Having a professional geologic pre-consultation from CGS which has provided mitigation measures for operations near unstable areas.

The THP includes an Erosion Control Plan (ECP) in THP Section V, pages 260-269. The ECP is an inventory, prioritization, and proposed treatment list of potential Controllable Sediment Discharge Sources (CSDS) in the plan area. This plan has 22 CSDS's, which were reviewed by the review team agencies, including CAL FIRE, NCRWQCB, CGS, and CDFW during the PHI. The identification and inventory of these sources shows how the current road system will be upgraded for long-term decrease in erosion to the watershed.

The THP addresses roads under item 24 of Section II of the THP (starting page 37). The Plan proposes to build 2,053 feet of new seasonal road. The FPRs require that all roads be maintained during the life of the THP as well as 3 years after completion of operations.

The CGS had recommendations surrounding road points, and unstable features that were all addressed. Additionally, a pre-consultation was done by CGS and is included in the THP on pages 238.1-238.5.

Sediment may also enter the watershed via the watercourse system. The RPF has mapped all watercourses within the THP area. During the PHI, the review team inspected a sample of the watercourses. The PHI team found the watercourses were appropriately identified and protection measures were consistent with the FPRs. The RPF utilized the WLPZ standards consistent with the Anadromous Salmonid Protection (ASP) rules. The 2009 ASP rules were developed to ensure rule adequacy in protecting listed anadromous salmonid species and their habitat, to further opportunities for restoring the species' habitat, and to ensure the rules are based on credible

July 26, 2022

science. The THP implements these minimum standards. According to the CAL FIRE PHI report, page 16, item 75 the CAL FIRE inspector reported the following:

If there are waterbodies within or downstream of the proposed Plan that are listed as water quality limited under Section 303(d) of the Federal Clean Water Act, has the RPF assessed for impacts that may combine with existing listed stressors to impair beneficial uses of the waterbody?

Inspectors Observations: During the PHI, I assessed the impacts to the beneficial uses of water. During the PHI, I observed that proposed road work, truck road watercourse crossing work and timber harvesting operations can be conducted without significantly impacting the beneficial uses of water. The proposed road work and road usage can be conducted with minimal potential sediment transport into watercourses by following soil stabilization measures listed under THP Item #18 and by following road work and road use instructions listed in the THP.

Item 76 on the next page (17) from the CAL FIRE PHI report, states the following:

Comments or general observations regarding Cumulative Impacts: The RPF is proposing new road and landing construction. However, new road and landing construction will be conducted to eliminate the need to skid logs over long distances through grass covered areas. The use of new roads and landings will have a significantly lower impact to soil resources than skidding logs through grass covered areas. I observed that ground based yarding operations can be conducted on a well designed skid trail network. I observed that ground based yarding operations can be conducted with minimal soil compaction, loss of growing space and with minimal damage to the residual timberstands. The steepest slopes will be cable yarded...This THP includes road work that will address past legacy erosion sites and will involve replacing truck road watercourse crossings and inboard ditch relief structures as well as abandoning one road segment with four truck road watercourse crossing and deactivating one road with two truck road watercourse crossings. These measures will significantly reduce sediment delivery into watercourses.

Lastly, pages 2 and 3 of PHI report generated by NCRWQCB states the following.

On June 27, 2012, the Executive Officer of the North Coast Regional Water Quality Control Board approved an erosion control plan (ECP) and site-specific management plan (SSMP) for RMP Revocable Trust property in the Garcia River watershed. The TMDL Action Plan requires that landowners evaluate their entire property and develop an ECP that includes an inventory of Controllable Sediment Discharge Sources (CSDS) and proposed corrective action. The approved ECP and SSMP establish an agreement between the Executive Officer and the RMP Revocable Trust detailing the methods for compliance with the terms of the Garcia TMDL Action Plan. Required elements of the approved SSMP have been incorporated into the THP 1-21-00199 MEN. Recent land acquisition in the Garcia watershed by the Burch family creates the need for submitting additional erosion control point inventory and proposed mitigation to update the existing SSMP. The landowner has submitted an updated ECP to the Regional Water Board for the current 1,948 acre ownership in the Garcia River watershed in order to maintain compliance with the provisions of the TMDL Action Plan. The majority of the newly inventoried CSDS have been evaluated in the field by Regional

July 26, 2022

Water Board staff during review of THPs 1-21-00171 MEN and 1-21-00199 MEN.

The RPF has incorporated the Water Qualities Review Team recommendations. The proposed silviculture system also provides an additional buffer to the watercourse system because of the additional tree canopy retention and surface cover remaining post-harvest. The residual stand intercepts rainfall and provides a more intact surface cover, especially in the cable yarding areas where exposed soil is minimized.

The THP also includes soil stabilization measures under item 18 of the THP. These measures ensure that exposed soil is treated to prevent erosion, roads and landings are maintained for proper drainage, and skids trails are treated. The completion of these activities minimizes soil erosion. Soil stabilization in combination with the WLPZ standards provides a sediment buffer to streams.

Stream temperatures are a result of a complicated ecosystem process including forestry, geology and hydrology. Shade from WLPZs moderates stream temperatures through retention of stream canopy. Excessive removal of riparian canopy could lead to excessive summer temperatures that may be lethal to aquatic invertebrates and fish. The retention of WLPZs even along clearcut units has been found to be effective in shading the streams. The amount of shade canopy and distance of WLPZs increases as the watercourse classifications change. For example, small class III watercourses that are capable of transporting sediment during the winter require less shade canopy due to their small stream size and intermittent nature. Class II watercourses, which support non-fish aquatic life, require more shade canopy and wider buffers. Class I watercourses, which support fish habitat, require the widest buffers with the highest shade canopy. The ASP rules were established based on scientific review and have established WLPZs that maintain current stream temperatures through shade canopy requirements.

The THP discloses numerous class I, II and III watercourses. These watercourses have protection measures outlined on pages 54 – 57 of the THP. In addition to the effects of canopy retention on stream temperature, groundwater and bank storage contributes to stream flow and is not subject to changes in temperature from canopy cover.

Given the protection measures on the THP and the field observations made on the PHI, CAL FIRE determined that sediment and temperature impacts have been mitigated and the proposed timber operations are appropriate based on the entirety of the Plan. The plan is in compliance with the FPRs in relation to watercourse protection. According to the PHI report, all watercourses have been correctly described and classified. The protection measures within the watercourses have been inspected and determined to be adequate to protect the beneficial uses of water, native aquatic and riparian species, and the beneficial functions of the riparian zone.

The THP also presents a winter period operating plan of the which the inspector states:

During the PHI, I determined that the RPF includes adequate measures to address protecting the beneficial uses of water during the wet weather and extended periods under THP Item #23.

Due to these mitigations and protection measures, and considering the requirements outlined in

July 26, 2022

the Forest Practice Rules it has been determined that the proposed project as presented will not cause or add to significant sediment or temperature cumulative impacts within the assessment area, follows the FPRs, and can reasonably be assumed to adequately consider and protect downstream beneficial uses.

CONCERN 2: Timberland in the lower gradient portions of WLPZ areas in the THP area should be classified as Site Class I timberland and not Site Class II or III timberland.

RESPONSE. The CAL FIRE inspector addressed this concern in the following manner:

During the PHI, I evaluated the timberstands throughout the THP area and determined that the RPF correctly identified the THP area as having Site II and Site III timberstands. The only area capable of growing Site I timberstands is flood prone areas that are covered with red alder trees. These areas will not be harvested.

Additionally, the RPF responded to this concern in the following manner.

STZs for unstable areas are mapped. See the Yarding Methods Maps in Section II. The plan area was assessed by the RPF for Site Class I near the Garcia River and was determined to be Site Class II due to soil type and tree height of redwood. The only soil occurring near the river in the floodplain with Site Class I is 107-Big River loamy sand, 0 to 5 percent slopes from the Mendocino Soil Survey (Western Part). See the Soil Map in Section V. This soil has on the basis of a 100-year site curve, a mean site index for redwood of 188. However, the location of this soil occurrence within the TIIP does not have redwood growing on it. This area has gravel with bay laurel trees and brush. No trees are marked for harvest and no operations are needed in this area; therefore, no increased retention standards are needed here. The Site Class for the plan area is Site Class II (Irmulco-Tramway Complex above the Garcia River), and Site Class III for other areas of the THP.

Given the protection measures on the THP and the field observations made on the PHI, CAL FIRE determined that Site Class was properly determined. The plan is in compliance with the FPRs regarding Site Class evaluation and therefore, considering the requirements outlined in the Forest Practice Rules, it has been determined that the proposed project as presented will not cause or add to significant cumulative impacts within the assessment area, follows the FPRs, and can reasonably be assumed to adequately address Site Class.

CONCERN 3: Proposed operations on slopes over 65% and general road building activities need to be reviewed.

RESPONSE. The CAL FIRE inspector addressed this concern in the following manner:

During the PHI, I walked along slopes with the two exception skid trail areas. I observed that the exception skid trails are located along slopes between a ridgetop road and a mid-slope road. The two exception skid trail areas are less than two acres. Tractor yarding can be conducted along existing skid trails that do not need to be constructed. The only way to cable yard these two areas would be construct two new roads and landings. The use of these two exception skid trails is appropriate... During the PHI, I evaluated the proposed road

July 26, 2022

construction and road abandonment with the RPF and the agency members who attended the PHI. During the PHI, I made no recommendations to address road abandonment for this THP.

Additionally, the RPF responded to this concern in the following manner.

The plan includes 4 short segments of skid trails that are located on slopes greater than 65% and are in good condition (stable), with the longest of these segments at 260'. All of these segments are proximal to the ridge top or break in slope and it is the RPF's assessment as stated in the THP (Section II and Section III) that this exception to the rule is justified due to cable yarding operations not being feasible in these areas due to poor deflection, blind leads, and lack of access points for safe operation of cable yarding machines, the trails that exist in these areas are not extensive and provide the only access to certain areas of the THP that would otherwise be inaccessible, and abiding by the standard rule would exclude these areas from timber operations which would not help meet a goal of maximum sustained production of high-quality timber products. Skid trails proposed for use are flagged with yellow "skid trail" flagging, are existing trails, and are in stable condition. No new skid trails may be constructed in these areas. Skid trails blocked off with skid trail flagging shall not be used by the timber operator. No winter operations on these exception skid trails unless amended otherwise. The mitigation for these trails are that water bars trails shall be spaced and constructed to meet the guidelines for the extreme erosion hazard rating.

Given the protection measures on the THP and the field observations made on the PHI, CAL FIRE determined that operations on slopes over 65% have been adequately mitigated, as well as other proposed road building activities. The plan is in compliance with the FPRs in this area and therefore, considering the requirements outlined in the Forest Practice Rules, it has been determined that the proposed project as presented will not cause or add to significant cumulative impacts within the assessment area, follows the FPRs, and can reasonably be assumed to adequately address operations on slopes over 65% as well as proposed road building activities.

CONCERN 4: Site preparation may occur outside of the timber covered areas in the plan area since brush and hardwood species may be impacted during site preparation operations.

RESPONSE. The CAL FIRE inspector addressed this concern in the following manner:

The RPF is proposing limited site preparation for this THP. During the PHI, I evaluated the need and potential impacts of site preparation to soil resources and the beneficial uses of water in both the timber covered and the non-timber covered areas in the plan area. I observed that the proposed seasonal road construction will be done in away so soil disturbance in the grass covered slopes is minimal. I observed that timber operations in grass and brush covered areas within the THP boundaries will be minimal. The proposed site preparation will be conducted in a way so that it will be done only where the shrub layer in the timber understory will be treated to ensure an additional age class of trees can be established in the understory. Site preparation is proposed on slopes less than 30 percent and outside of watercourse and wet area protection zones.

Additionally, the RPF responded to this concern in the following manner.

July 26, 2022

There are no site preparation or any other operations proposed outside of logging units, which would be outside of the Timber Harvest Boundary. See Section II, Item 14(i)(l)(f).

These responses from the CAL FIRE inspector and the RPF adequately address the concern.

CONCERN 5: Will the proposed extended wet weather period timber operations comply with Garcia River TMDL requirements.

RESPONSE: See response to **Concern 1**. Additionally, the CAL FIRE inspector addressed this concern in the following manner:

During the PHI, I evaluated the proposed extended wet weather timber operations plan in the THP. During the PHI, I determined that the RPF has addressed wet weather and extended wet weather timber operations under THP ITEM #23.

Additionally, the RPF responded to this concern in the following manner.

The provided SSMP is a previously approved document by the North Coast Regional Water Control Board from 2012 and it is the intention that THP 1-21-00199MEN is to follow the approved SSMP. Limited operations are proposed during the extended wet weather period, and are included in the THP directly from the approved SSMP. Although the SSMP allows for certain operations within the extended wet weather period such as road construction, the THP is still proposing that no road construction is permitted within the extended wet weather period as indicated by the boxes checked "No".

These responses from the CAL FIRE inspector and the RPF adequately address the concern.

CONCERN 6: The impacts to the beneficial uses of water during water drafting operations needs to be evaluated. Is WH1 a permitted pond under CDFW 1600 permit process? What are the impacts to anadromous fish habitat at water drafting site WH2? Is the Pond a legal structure and is it viable?

RESPONSE: See response to **Concern 1**. The CAL FIRE inspector addressed this concern in the following manner:

During the PHI, I evaluated the proposed water drafting sites and potential impacts to fish habitat. The pond drafting site does not contain fish habitat. The Garcia River water drafting site can be used with minimal impacts to fish habitat.

During the PHI, I evaluated the proposed wet area protection measures for this THP. During the PHI, I made no recommendations to address wet area protection measures. The RPF shall be required to provide surveys to obtain a technical assistance letter from the US Fish and wildlife Service for California red legged frogs. During the PHI, CDFW Biologist Adam Hutchins recommended that the mud flows at Map Point 45 and the water drafting site at WH1 Be evaluated for California red legged frog habitat.

July 26, 2022

Furthermore, page 4 of the PHI report from NCRWQCB stated the following:

Public comments raised questions whether the pond that is proposed to be used for water drafting for dust abatement (Map Point WH1) in the northern portion of the plan area has been recently constructed without applicable permits. The pond appears to be quite old was likely used by whoever used the historic barn located next to it. We evaluated the Class II watercourse below the pond to verify it could not function as refugia for salmonids. The channel gradient is over 20% at least as far as the plan boundary and as such, presents a gradient barrier for fish.

Additionally, the RPF responded to this concern in the following manner regarding WH1 and WH2.

The silviculture adjacent to the watercourse is Single Tree Selection for WLPZs. The pond is older than described and can barely be identified now on the Lidar imagery. Therefore, it never would have been identifiable from the aerials. The pond is small and appears to have been present for more than 10 years. Below the pond (which is enclosed in an established fenced area to keep cattle out), is a larger wet area prior to a channel forming. The gradient of the channel in proximity to the pond is too steep for a Class I classification. The unstable area mapped downstream of WH1 can be described as steep, unstable hillslopes adjacent to two Class II-S watercourses. It is inaccurate to describe the unstable area as being at the pond, as it is quite a ways down stream of the pond and is related to the topography, geology and soil conditions in a separate location rather than the pond itself...

The pond has been used for stock watering for decades and is mapped as "Water Hole (for dust abatement)" on the THP maps for THP#I-97-302MEN...

CDFW will provide a draft agreement to the landowner for the notified Lake and Stream bed Alteration Agreement included in the THP in Section II, Item 26 in which conditions for water drafting will be included. The finalized agreement will be amended into the THP once received from CDFW. The THP will follow these conditions developed by CDFW for water drafting.

These responses from the CAL FIRE inspector, the NCRWQCB, and the RPF adequately address the concern.

CONCERN 7: The proposed watercourse protection measures need to meet both Anadromous Salmon Protection (ASP) Rule and Garcia River TMDL requirements.

RESPONSE: See response to **Concern 1**. Additionally, the CAL FIRE inspector addressed this concern in the following manner:

During the PHI, I evaluated the proposed watercourse protection measures with the RPF and other agency members. This included viewing WLPZ flagging, WLPZ timber mark, timbermark in Class III ELZ's and in-lieu practice areas. During the PHI, I made no recommendations to address in-lieu practices or operations within WLPZ's or Class III

July 26, 2022

watercourse ELZ's.

Given the protection measures on the THP and the field observations made on the PHI, CAL FIRE determined that the proposed watercourse protection measures meet both the Anadromous Salmon Protection (ASP) Rule and Garcia River TMDL requirements. The plan is in compliance with the FPRs and therefore, considering the requirements outlined in the Forest Practice Rules, it has been determined that the proposed project as presented will not cause or add to significant cumulative impacts within the assessment area.

CONCERN 8: Regarding proposed watercourse crossing work, alternatives to culvert watercourse crossings should be considered.

RESPONSE: The CAL FIRE inspector addressed this concern in the following manner:

During the PHI, I examined road points and watercourse crossings with the RPF and the other agency members. I observed that culverts are an appropriate truck road watercourse crossing structure for permanent watercourse crossings. The isolated areas of the THP will be accessed with temporary truck road watercourse crossings.

This response from the CAL FIRE inspector adequately addresses the concern, and alternatives were considered.

CONCERN 9: Protection measures for Point Arena mountain beaver habitat have not been adequately addressed.

RESPONSE: The CAL FIRE inspector addressed this concern in the following manner:

I have had training in identifying and providing protection for this species. During the PHI, I evaluated protection measures for Point Arena mountain beaver habitat with the RPF and CDFW Biologist Adam Hutchins. The RPF is required to conduct surveys by a qualified biologist in order to obtain a technical assistance letter from the US Fish and Wildlife Service.

Furthermore, from page 14 of the PHI report from CAL FIRE is the following:

The THP area is within the range of Point Arena mountain beavers. During the PHI, I agreed with CDFW Biologist Adam Hutchins that habitat for this listed species occurs within the THP area. The RPF is proposing to have a qualified biologist survey for Point Arena mountain beavers at least eight weeks prior to operations and amend protection measures into the THP. During the PHI, CDFW Biologist Hutchins recommended that the PHI is not complete until the Point Arena mountain beaver assessment is included into the THP and a field assessment by CDFW can be made. The only requirement for Point Arena habitat that can be made is to require that the RPF obtain the technical assistance letter from the US Fish and Wildlife Service and amend it into the THP prior to the start of timber operations. Therefore, this PHI can be considered complete.

July 26, 2022

Additionally, the RPF provided the following response:

The plan states that habitat assessment, survey and protection measures will be amended into the THP once surveys have been completed, prior to operations. Please see the response to the First Review Question #5 (CDFW).

These responses from the CAL FIRE inspector and the RPF adequately address the concern.

CONCERN 10: Protection for listed bird species and anadromous fish has not been adequately addressed in the THP.

RESPONSE: The CAL FIRE inspector addressed this concern in the following manner:

During the PHI, I reviewed listed bird species and anadromous fish protection measures with the RPF and CDF Biologist Adam Hutchins. No listed bird species or anadromous fish protection measures were made during the PHI.

Please refer to Item 32, Section II, starting on page 84 to see protection measures for various species. Additionally, please see the Biological Resource Assessment Area discussion beginning on page 171 of Section IV. The plan is in compliance with the FPRs in this area and therefore, considering the requirements outlined in the Forest Practice Rules, it has been determined that the proposed project as presented will not cause or add to significant cumulative impacts within the assessment area, follows the FPRs, and can reasonably be assumed to adequately address operations on slopes over 65% as well as proposed road building activities.

CONCERN 11: A local resident whose property is adjacent to the THP area requested that no timber harvesting operations take place within 300 feet of the property line.

RESPONSE: The CAL FIRE inspector addressed this concern in the following manner:

During the PHI, I viewed this area of the THP area to assess for visual impacts and noise impacts. During the PHI, I made no recommendations to address this concern. The proposed silviculture will not significantly impact the visual impacts.

Additionally, there is a lengthy discussion on noise and noise mitigation starting on page 213, Section IV, of the THP. Given the protection measures on the THP and the field observations made on the PHI, CAL FIRE determined that operations have been adequately mitigated. The plan is in compliance with the FPRs in this area and therefore, considering the requirements outlined in the Forest Practice Rules, it has been determined that the proposed project as presented will not cause or add to significant cumulative impacts to the adjacent landowner, follows the FPRs, and can reasonably be assumed to reduce impacts to neighboring landowners to less than significant.

July 26, 2022

CONCERN 12: A local resident whose property is adjacent to the THP area wants to be assured that his water resources and timber resources are not impacted during timber operations.

RESPONSE: The CAL FIRE inspector addressed this concern in the following manner:

During the PHI, I observed that property boundaries and THP boundaries are well marked. I am familiar with this adjacent landowner since I inspected the NTMP on their property in the past.

Furthermore, page 11, question 41 of the PHI report, from CAL FIRE is the following:

The RPF identifies 15 landowners who are within 1000 feet of the THP boundaries. The RPF contacted these landowners by mail and submitted a newspaper notification in the Independent Coast Observer dated December 17, 2021 regarding domestic water supplies. The RPF did not receive any responses to these domestic water queries. The RPF is not proposing an exception to 14 CCR 1032.10, and no information was received to provide domestic water sources beyond standard WLPZ rules.

In Section V of the THP, the RPF notified all downstream landowners, as well provided a proof of publication (see pages 280-286) in accordance with FPR requirements to notify downstream landowners within 1,000 of harvest operations.

Given the protection measures on the THP and the field observations made on the PHI, CAL FIRE determined that operations have been adequately mitigated. The plan is in compliance with the FPRs in this area and therefore, considering the requirements outlined in the Forest Practice Rules, it has been determined that the proposed project as presented will not cause or add to significant cumulative impacts within the assessment area, follows the FPRs, and can reasonably be assumed to reduce impacts to neighboring landowners to less than significant.

CONCERN 13: There is a concern that the process of a sampling marking allows for plan area to not be sufficiently assessed

RESPONSE: The RPF addressed this concern in the following manner:

The entire plan area has already been analyzed for potential species and water quality impacts prior to submission and has been described in the plan. The justification for not completing the marking prior to operations does not need to be stated as it is the requirement by the Forest Practice Rules 14CCR 913.2 (a)(I) and not completing the mark prior to felling would be a direct violation of the rules.

14 CCR 913.2 (a)(1) is as follows:

Trees to be harvested or trees to be retained shall be Marked by or under the supervision of the RPF prior to felling operations. When openings greater than one-quarter (.25) acres will be created, the boundaries of the Small Group(s) may be designated in lieu of Marking individual trees within the Small Group areas. A sample area must be Marked prior to a preharvest inspection for evaluation. The sample area shall include at least ten (10) percent of the Harvest Area up to a maximum of twenty (20) acres per stand type which is representative of the range of conditions

July 26, 2022

present in the area.

The CAL FIRE inspector addressed this concern in the following manner on page 5 of the PHI report (item 20):

During the first day of the PHI, I viewed all of the sample marked areas for both silviculture systems. During the PHI, I observed that the RPF provided a sample mark along the terraces, upper slopes, lower slopes and had marked the WLPZ's prior to the PHI. I observed that the sample mark included areas of all timberstand densities and areas where species composition varied. I observed that the RPF sample marked more than ten percent of the transition and group selection areas and all of the WLPZ's prior to the PHI. During the PHI, I made no recommendations to address sample marking of timberstands.

These responses from the CAL FIRE inspector and the RPF adequately address the concern.

CONCERN 14: There is a concern regarding the lack of an Erosion Control Plan.

RESPONSE: The plan does include an Erosion Control Plan. See Section V of the THP.

CONCERN 15: There is a concern that Forest Practice Rules, or the plan itself, do not require/provide for enough inspections.

RESPONSE: The RPF addressed this concern in the following manner:

The THP states that seasonal roads shall be inspected "at least once" during the wet period and shall follow a large rain event. This means that if there are multiple large rain events during the winter, then the roads would be inspected more than once. This is the standard for the seasonal roads themselves, however watercourse crossings listed as "Controllable Sediment Discharge Sites" are included in the Erosion Control Plan in Section V which has a monitoring and inspection schedule of 3 times per winter period. Therefore seasonal roads with CSDS's shall be inspected a minimum of 3 times during the wet period, seasonal roads with no CSDS shall be inspected at least once, following large rain events.

The Erosion Control Plan has an outline and schedule for road and watercourse crossing monitoring during the winter period. This includes at least 3 surveys; the first prior to November 15, the second after 10 inches of cumulative rainfall prior to March 1, and one more time after April 1. This includes crossings on appurtenant roads. Historic structures would be discussed in a confidential archaeological addendum which is not available to the public.

Additionally, from the discussion of the Review Team process above, is the following:

If a THP is approved, logging may commence. The THP is valid for up to five years, and may be extended under special circumstances for a maximum of two more years, for a total of seven years.

July 26, 2022

Prior to commencing logging operations, the Registered Professional Forester must meet with the licensed timber operator (LTO) to discuss the THP (CCR §1035.2); a CAL FIRE representative may attend this meeting. The Department makes periodic field inspections to check for THP and rule compliance. The number of inspections depends upon the plan size, duration, complexity, and the potential for adverse impacts. Inspections include but are not limited to inspections during operations pursuant to Public Resources Code (PRC) section 4604, inspections of completed work pursuant to PRC section 4586, erosion control monitoring as per PRC section 4585(a), and stocking inspection as per PRC section 4588.

CONCERN 16: The SSMP is not consistent with the Basin Plan and should not be approved.

RESPONSE: The SSMP provided on page 248 through 256 was approved by NCRWQCB in 2012 (see page 245).

CONCERN 17: The watercourses have not been properly classified and the watercourse protection measures are not adequate, and that rules and permits are not being followed.

RESPONSE: The CAL FIRE inspector addressed this concern on page 9 of the PHI report in the following manner:

The RPF identifies Class I, Large Class II, Standard Class II, Class III watercourses and wet areas within the THP area. During the PHI, I made one watercourse mapping recommendation, Jim Burke from the NCRWQCB made a watercourse mapping recommendation and CDFW Biologist Adam Hutchins made a watercourse classification recommendation.

During the PHI, I observed that the RPF correctly identified the Class III watercourse channel on the ground. However, the RPF does not show on the THP map that this Class III watercourse channel extends within 200 feet of the mid slope road above the truck road watercourse crossing at Map Point 4. The RPF shall revise the THP prior to Second Review to show that the Class III watercourse channel above Map point 4 extends within approximately 200 feet of the midslope road above the truck road watercourse crossing at Map Point 4. This is addressed as CAL FIRE PHI Recommendation #2. The RPF identifies an inboard ditch relief culvert at Map Point 46.

The RPF identifies a Class III watercourse channel below Map Point 46. During the PHI, the agency members observed that this Class III watercourse channel extends to the culvert at Map Point 46. During the PHI, Jim Burke from the NCRWQCB agreed to make this THP recommendation.

During the PHI, the RPF, CDFW Biologist Adam Hutchins and I walked the two watercourse channels above the inlet of the Class I truck road watercourse crossing at Map Point 11 to see if these two channels are restorable Class I watercourses. It appears that stream

July 26, 2022

gradients and pool formation suggest that the two watercourse channels above the culvert inlet at Map Point 11 are Class I watercourses for a distance of approximately 250 feet.

During the PHI, CDFW Biologist Adam Hutchins agreed to make this PHI recommendation. During the PHI, I observed that the RPF properly mapped and classified the other watercourses observed during the PHI. During the PHI, I observed that the RPF had properly mapped and classified the wet areas in the THP area.

The RPF addressed this concern in the following manner:

The protection measures for watercourses are consistent with ASP and the Forest Practice Rules, and additional buffers or distances are not required as the THP complies with Option 2 for the Garcia River TMDL which is to operate under an approved SSMP and ECP developed by the landowner. The RPF was directed by Water Quality to include the previously approved SSMP into this THP, while providing an update to the property's Erosion Control Plan and long-term road maintenance by including an ECP for the Seventh Heaven THP roads and crossings.

The watercourse below WH 1 is a Class 11-S watercourse due to gradient and distance from the Class I (which is off property). The SSMP is an approved document and is the alternative option (Option 2) to the Basin Plan. It is unclear how other applications of the FPRs and Water Code are not in place.

These responses from the CAL FIRE inspector and the RPF adequately address the concern.

CONCERN 18: There is a concern surrounding botany surveys.

RESPONSE: The RPF responded to the concern in the following manner.

As stated in the THP in Section II and Section IV, a Botanical Report and Survey are currently being conducted and will be amended into the plan- with protection measures for all special status plants- prior to operations. Operations may not commence prior to the amendment of this report.

See pages 92, 172-173, and 199. This response from the RPF adequately addresses the concern.

CONCERN 19: The remaining concerns address 22PC-000000078. This public comment was received on June 23, 2022. The first concern from 22PC-000000078 surrounds a well water system on the property of Robin Applegarth's property.

RESPONSE: The CAL FIRE inspector addressed this concern on page 1 of his June 30, 2022 inspection report.

During this inspection, I observed that the well is approximately 100 feet north of the property

July 26, 2022

line that is identified on the ground with a barbed wire fence. The property boundary fence is located within non timber coverer field. Therefore, the timber operations will not impact the landowners well. 9

The RPF has adequately notified the owners of the property at the time of resubmission of the THP, both as an adjacent landowner and a downstream landowner in accordance with 14 CCR 1032.7 and 14 CCR 1032.10. Specifically, 14 CCR1032.7 (e) states that the adjacent landowner list must be compiled within 60 days of submission of the plan. This appears to have been done, and the notification requirements for this THP are considered to have been met.

CONCERN 20: This concern requests a no cut “habitat buffer” adjacent to the commenter’s parcel.

RESPONSE: The CAL FIRE inspector addressed this concern on page 1 of his June 30, 2022 inspection report.

During the inspection and during the PHI, I viewed the timberstands, the sample mark and I am familiar wind patterns in the THP area. The silviculture is single tree selection. My conclusion, is that timber operations will not result in significant wind damage to the adjacent landowner’s property.

CAL FIRE concurs with this conclusion regarding wind. Otherwise, Section IV of the THP largely deals with habitat for various species throughout the THP and the greater assessment area. Given the protection measures on the THP and the field observations made on the PHI, CAL FIRE determined that habitat protection has been adequately mitigated. The plan is in compliance with the FPRs in this area and therefore, considering the requirements outlined in the Forest Practice Rules, it has been determined th0at the proposed project as presented will not cause or add to significant cumulative impacts to habitat within the assessment area, follows the FPRs, and can reasonably be assumed to reduce impacts to neighboring landowners to less than significant.

CONCERN 21: This concern inquires about a specific plant and a specific mammal that may be present in the area.

RESPONSE: Regarding the Red Tree Vole, Please refer to page 93 and 185 of the THP. Rare plants will be surveyed for prior to harvest. CDFW properly requested that botany survey timing be included in Section II and this revision was provided as a revised page 92 on April 8, 2022. The botany scoping list is on page 362.1, with the plant of concern being on page 362.5.

CONCERN 22: This concern inquiries about the mapping of powerlines on the NOI.

RESPONSE: The RPF is not required by the FPRs to map powerlines per 14 CCR 1032.7, but has correctly disclosed them on the NOI. No further adjustments are required to the revised NOI per

July 26, 2022

the FPRs, and the NOI is in compliance and it has been determined that all downstream and adjacent landowners have received proper notification.

From: [Claudia Hillary](#)
To: [Santa Rosa Public Comment@CALFIRE](#)
Cc: [chillary@mcn.org](#)
Subject: Plan 1-21-00199-MEN Resubmission
Date: Saturday, February 5, 2022 10:03:41 AM

Warning: this message is from an external user and should be treated with caution.

We live on parcel 027-256-1600 in T12N R16W Section 9 which adjoins for about 400' a parcel that will be logged under this plan. We would like to request that no harvest take place within 300' of our property line. Thank you for your consideration.

Tim and Claudia Hillary
40091 Garcia River Road / Buckridge Road / CR 507
Point Arena, CA 95468
707-882-3664

RECEIVED

FEB 05 2022

**COAST AREA OFFICE
RESOURCE MANAGEMENT**

From: Alan Levine <alevine@mcn.org>
Sent: Monday, February 7, 2022 5:14 PM
To: public.comments@fire.ca.gov; Santa Rosa Public Comment@CALFIRE
Subject: Comments THP 1-21-00199 MEN Seventh Heaven
Attachments: 1998 Recovery Plan for the Point Arena Mountain Beaver.pdf; 21-00199 MEN Seventh Heaven.docx

Warning: this message is from an external user and should be treated with caution.

Attached are comments - THP 1-21-00199 MEN

Plus - Copy of PMB recovery plan

Please acknowledge receipt

Alan Levine
Coast Action Group
Affiliate of Redwood Coast Watersheds Alliance
(707) 542-4408

RECEIVED

FEB 07 2022

**COAST AREA OFFICE
RESOURCE MANAGEMENT**



P.O. BOX 215
POINT ARENA, CA 95468

February 7, 2022

Affiliate of Redwood Coast Watersheds Alliance

RECEIVED

FEB 07 2022

Calfire and Review Team Agencies

**COAST AREA OFFICE
RESOURCE MANAGEMENT**

Subject: Preliminary Comments 1 – 21 – 00199 MEN – Garcia River

Garcia River watershed (inclusive of tributaries noted in the plan) are listed on the State of California List of Water Quality Limited Segments (303 (d) list) – for pollutants sediment and temperature. This THP must acknowledge this impaired condition, by both pollutants, and demonstrate how the plan is in compliance with the standards required by the Garcia River TMDL and Basin Plan. Basin Plan language states that all controllable pollutants (active and potential sources) will be controlled (absolutely limited) under operations described in the plan. This responsibility commences with an accurate description of the plan, watershed conditions, and actions required and taken to control all existing/active and potential pollution sources by use of narrative/descriptive language, maps, charts, inventories, and monitoring data. Description and analysis provided must be inclusive of historic activity that has affected the watershed and the area in the plan.

THP: 895 acres

Single Tree Selection: 134 acres

Group Selection: 287 acres where 80% of area must meet 75 sq. ft/acre (20% using 300 pt. count)

Transition: 386 acres where area must meet 50 sq. ft/acre stocking

Single Tree Selection (WLPZ): Retention (See Item 26, see Garcia TMDL standards plus ASP)

Unstable Areas (STZ): Group Selection and Transition where areas must meet 100 sq.ft/acre combination of conifers and hardwoods (See Garcia TMDL standards plus ASP)

All site classes are noted to be Site Class II and III. The Plan should be assessed for site Class I in lower gradient WLPZ areas near Class I and Class II streams. A change in site class would alter retention standards.

Operations, and retention standards, do not meet Garcia River TMDL standards for unstable areas. To meet CEQA requirements, STZs must be mapped.

Sample marking in Transition and Group selection units is not sufficient to assess impacts on resources (species and TMDL compliance). If the entire plan is to be marked prior to operations (as stated in the plan), there is no justification presented for not completing that job to assure full description of the plan allowing for more complete disclosure and analysis of potential species and water quality impacts.

Site preparations that may occur outside of silviculture units must be mapped. This may be areas of brush and hardwood management not included in logging units.

Item 18: The plan does not note Garcia River TMDL requirement of an Erosion Control Plan (inclusive of inventory and time scheduled remediation of all existing and potential sediment sources). This is required by the Basin Plan and Non-point Source Policy which includes mandates for robust implementation and effects monitoring (controlling all controllable sources of pollutants) . Please demonstrate compliance with these issues in the plan.

Item 21: Use of ground based equipment on slope greater 65% -These areas need serious agency review in the field.

Item 23: Extended Wet Weather Operations. Due to erosion potential during these extended wet weather periods operations should be strictly limited. Such controls are not evident in the plan. See- Garcia River TMDL/Basin Plan and Non-point Source Control management criteria. The SSMP provided: 1) is not consistent with previous boxes marked No in the above sections, 2) does not provide adequate assessment and control of pollutant sources (inclusive of the pollutants sediment and temperature). .

Item 24: 2000 feet of new seasonal road construction. Over 1000 feet or road to be deactivated or abandoned. Please assess.

Item 24/25: MP 2,3,4, 7, 12, 13, 14, 15, 17, 21, 23,24,25,26, 27,28, 29, 30, 31,32,33,34, 36, 39,41,42,44,47,48,49, 52 – assess for 24” culvert, rocked rolling dip, or other remedy. MP 8 – what other solutions might work? Apparently the existing culvert and drainage management is not sufficient.

Included in the plan area are numerous erosion sites that should have been corrected previously, under prior ownerships and as part of previous harvest operations. This is a criticism of previous Review Team management of this ground under the auspices of the Garcia River TMDL and Basin Plan requirements. The Review Team needs to be more on top of these erosion control and thermal management issues. What happened with previously mandated implementation and reporting? This is evidence of ongoing erosion where the plan calls for some repairs that should have previously been implemented. It also demonstrates the need for application of protection measures of all controllable and potential sources along with specific monitoring controls to assure compliance.

Item 25: Seasonal Road Inspection. The plan notices limited use and limited inspection. The limited inspection is noted to be once per year after significant rain. If you look at the regional hydrograph, significant rain can occur more than once per season. A more robust inspections regime should be required under road maintenance guidelines.

Item 26: Water Course Protection measures. This section notes the existence of the Garcia TMDL, which includes specific watercourse protection criteria. In this case both ASP and the Garcia TMDL watercourse protections apply as base line criteria for protections. That is the greater protection of either ASP or the TMDL must be applied. Stated in the TMDL (Basin Plan): *“no commercial land management activities, including commercial or salvage timber harvest, grazing or crop agriculture, within the first 25 feet of the Riparian Management Zone for Class I or II watercourses.”* This applies to all Class I and Class II watercourses (inclusive of Class IIs) in addition to the ASP language. The TMDL language makes no differentiation between Class IIL and Class IIS in the Garcia River TMDL.

Additionally: *“On Class I and II watercourses, at least five standing conifer trees greater than 32 inches in diameter at breast height (DBH) are permanently retained at any given time per 100 linear feet of watercourse. Where sites lack enough trees to meet this goal, there shall be no commercial harvest of the five largest diameter trees per 100 linear feet of watercourse.”*

And:

“There is no removal of trees from unstable areas within a Riparian Management Zone that have the potential to deliver sediment to a water of the State unless the tree is causing a safety hazard.”

The above is to be applied in addition to ASP

Site Specific Management Plan (SSMP) Validity and Application: In part, erosion control practices in this THP rely on a SSMP. However, the SSMP is not applicable – due to: Necessary elements of an SSMP are not extent. A partial list of SSMP required measures not included are: 1) Long term Road System Management Plan for all properties in the Garcia River, 2) Supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding measures of the Garcia River Management Plan, 3) Description of Land Management Measures to Improve the Condition of the Riparian Management Zone, 4) The Site- Specific Management Plan shall include a description of, and schedule for, the Land Management Measures and any restoration activities the landowner proposes to improve or maintain the condition of the Riparian Management Zone such that it provides:

- Stream bank protection,

- Filtering of eroded material prior to its entering the watercourse channel, and
- Recruitment of large woody debris to the watercourse channel and flood plain.

In addition, the description shall include supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding riparian measures of the Garcia River Management Plan.

The above standards applied to the SSMP indicate (elements demonstrated in the THP including: improper stream classifications and protections, failure to address temperature issues, failure to meet mandated SSMP constituents, illegal water containment facilities, etc) that the applicability of the SSMP and/or applied measures in the THP fail to meet the regulatory standard. Also indicated is the need for more robust standards and controls. Furthermore, such SSMP as part of a permitting apparatus under regulatory structure must be provided to the public and other responsible agency as part of review and approval process. Noticing this SSMP for review has not occurred. Note: All policy and plan development in the Basin Plan is subject to public noticing and review.

The THP, and related SSMP, are not consistent with Non-Point Source Policy in the Basin Plan. This THP, and related SSMP, cannot be approved, nor can it be adopted into the General WDR for Timber Operations on Private Lands until consistency with the Basin Plan (all related elements) is attained. Note: FPR 898.2 Special Conditions Requiring Disapproval of a plan: *‘Implementation of the Plan as proposed would cause violation of any requirement of an applicable water quality control plan (Basin Plan) adopted and approved by the State Water Resources Control Board.* “ This criteria also applies to damage to listed species and their habitat.

The THP Water Course Protections noted in the plan are incorrect and need to be revised.

Please note: This plan is in the Coastal Zone. Certain Coastal Zone applicable protections apply to resources ; i.e. wet areas and areas in ELZ s and wet areas exhibiting hydric plants or aquatic species meet state wetland definitions and are protected under the Coastal Act as ESHAs. Thus, these areas deserve 100’ buffers that must be flagged in the plan area.

Noted: In all of this discussion of pollutant control, we have not found evidence in the plan of issues related to the control of stream temperature.

Un-named Tributary (S2 Transition Silviculture – commencing WH 1): This may be the site of a historic AT & T fiber-optic drilling project, 1992 (please check the records for accurate identification of the site). Coho salmon were found in the stream. This might require a change in stream classification. PMBs, and other wildlife were also found (see attached report and CDFW Report, Rick Macedo). Additionally, I believe Ted Wooster found PMBs in this tributary (and

elsewhere in Class II watercourses). The stream in question commences at WH 1 (area of the recent unpermitted pond). This tributary (headwaters at WH -1 runs cold and is a refugia for fish during periods of warm water flows (personal communication with Craig Bell – watershed coordinator and river guide). A slide/unstable area at the headwaters is noted in the mapping. Also noted in the mapping is a unstable area which actually is the called out as WH 1 is pond area to be used for water extraction. This watercourse is an important habitat area. Transition silviculture adjacent to this area is inappropriate and not consistent with the FPRs, Fish and Game Code, Coast Act, and Water Code.

Included is a link with discussion of the AT&T spill effects (document attached):

https://www.krisweb.com/biblio/garcia_frog_higginsetal_1992_mud.pdf

CDFW (DFG at the time) was seriously involved in this spill and remediation as there were federal ESA and State CESA issues. Thus, sufficient documentation should be available from CDFW.

Hathaway Creek Headwaters – this area in and adjacent to the plan is another sensitive area. Hathaway Creek is a Class I stream almost up into the plan. I biologic survey (for previous THPs) in this area of Hathaway Creek found steelhead trout, PMB, heron rookery, pigmy owl, NSO, and red tree vole. Care should be taken with operations in this area – where buffers should be provided from the planned Transition silviculture.

Item 26: Water Drafting. The plan indicates water drafting to occur as sites WH 1 and WH 2.

WH 1 is the headwaters of an important coho refugia stream (a sensitive area – discussed above). Furthermore, from the history of that property – from 1985 (I was rented that land for rearing cattle) - that pond was not there. Note: Fairly recent Google Maps Satellite shows no pond there. That Google satellite is less than 8 old. When was that pond created? Where is the permitting for that pond (CDFW 1600, Division of Water Rights, grading permit, stormwater permit for construction)? How much water is in the pond? Is there a water right for water use from that pond? Essentially the question is; is the pond a legal structure? Please assess viability of that pond and potential effects on this watercourse.

The other point noted for water drafting is WH 2. It should be noted that the Garcia River has been experiencing a documented fishery resurgence – with many species of salmonids and egg nests (redds) noted in the lower river and adjacent to this plan (CDFW/Craig Bell spawner surveys). However, during the low rain period of last year this area of the river was subject to extremely low flows. Thus, fish were subject to high temperature and had difficulty finding refugia. If drafting is to occur at this point there must be established procedure to assess any impacts of such drafting on stressed fish populations. Additionally, assessment should occur addressing potential impacts of any instream activity on redds.

As part of the stream classification process and the above noted observations of fishery recovery in the lower Garcia mainstem (and in the area of this plan), small watercourse contribution of cold water , and cold water refugia during periods of low flows, warm temperature, and warm stream temperature; please be aware of the existence of and necessity to maintain and protect these habitat/refugia areas. As noted by Craig Bell, as a long time river guide and watershed coordinator, these small side stream cold water refugia exist in this section of the Garcia are necessary for fish survival during periods of stream temperature stress. Craig Bell specifically indicated that he as seen the waters of un-named creek (headwaters at WH 1) being used as thermal refugia.

Item 32 – 35: Biologic Resources. Various species are misrepresented in this assessment and claimed protections as applied.

PMB (Point Arena Mountain Beaver – federally listed as Endangered): PMBs have been found in the tributary (WHI 1/ S2 - discussed above). Ted Wooster (CDFW) found PMBs in other areas on the property – including areas around the turn of the river on the eastern facing perimeter of the property. This plan has not been appropriately surveyed for PMB presence. The plan notes presence in certain sectors and denies presence in other sectors. The plan also calls for a survey 8 week prior to commencement of operations. First, a trained expert needs to accomplish such survey, looking at all potential habitat areas, inclusive of northern and eastern perimeters of the plan. Specific protections for PMBs have not been described in the plan. Protections must be consistent with the PMB Recovery Plan. Please note that stream protections noted the plan do not address issues related to protection of PMB colonies and related habitat, nor has it been assessed that these protective standards are sufficient for protection of PMBs and PMB habitat requirements.

The plan does not sufficiently address issues related to PMB protections. It appears that the plan preparer failed to review available documents – including Recovery Plan for the Point Arena Mountain Beaver (*Aplodontia rufa nigra* – 1998 – link below)

<https://www.fws.gov/arcata/es/mammals/mtnbeaver/documents/1998%20Recovery%20Plan%20for%20the%20Point%20Arena%20Mountain%20Beaver.pdf>

Mapping in the plan is not inclusive of all know PMB colony sits. The second and 3rd (MP1 – stream below the un-permitted pond) tributaries in have had documented PMB colonies (Wooster, Steele). There are other colonies further upstream; including one across the river from the eastern perimeter of the plan. As stated above, a good portion of this plan is in the Coastal Zone, subject to Coastal Act protections for species and related habitats. The first streams in are definitely in the Coastal Zone. There are other colonies upstream, including the one on the other side of the river on the eastern perimeter of the plan. This suggests there are yet to be found other colonies – which should be the subject of a valid survey.

The plan calls for a survey prior to operations. This is not in accordance with CEQA mandates of the plan providing a full and complete description of the site condition. Additionally, with such a

survey and review by responsible agency (CDFW, USFWS) and the public, there is insufficient information to apply protections (including ESHA mandated buffers) for colonies, foraging habitat, and migration corridors (as noted in the Recovery Plan). Thus, a survey must be provided, for review, prior to plan approval. This is also consistent with Coastal Act requirements and ESHA protections mandated in the Coastal Act, CDFG Code, the Federal ESA, and actually the Forest Practice Act.

As noted above, part of the Plan does fall into the Coastal Zone - inclusive of the pond and PMB habitat areas on western perimeters and the first few streams on the western (downstream) perimeter of the plan.

The Recovery Plan speaks to:

List of known colonies (which has been updated since publishing the Recovery Plan)

Need to maintain migration corridors – allowing for breeding and genetic diversity as well as finding food sources (pp.26 – 31)

Conservation Measures: Timber Harvest Plans must determine the presence or absence of Point Arena Mountain Beaver and take steps to avoid disturbance. Inclusive of Technical Rule Addendum No. 2 “Biological assessment areas will vary with the species being evaluated and its habitat. Factor to consider in the evaluation of cumulative biological impacts include: 1) Any known rare, threatened, or endangered species or species of special concern...that may be directly, or indirectly, affected by project activities...”. Section 1034, Contents of Plan, includes information on the presence and protection of known habitat or individuals of any listed species which may be significantly impacted by the plan.

Forest Practice Rules (in the context of the above noted information:

Section 898.2 Special Conditions Requiring Disapproval of Plans – Implementation of the plan as proposed would result in either a “taking” or a finding of jeopardy of wildlife species listed as rare, threatened, or endangered by the Fish and Game Commission, the National Marine Fisheries Service, or the Fish and Wildlife service, or would cause significant, long-term damage to listed species. Additionally, a plan must be disapproved if there is evidence that the information in the plan is incorrect, incomplete, or misleading in a material way, or is insufficient to evaluate significant environmental effects.

Along with a competent survey, consultation should occur with the United States Fish and Wildlife Service.

Salmonids (threatened species): The THPs state that protections are in place for salmonids are included in the plan. However, creek, with headwaters as WH 1 may be misclassified as a Class II, when in fact this creek supports salmonids during critical flow periods (shade and cold water). The SSMP fails to provide sufficient watercourse protections as called out in the specific TMDL prescriptive language for tree retention, no cut buffer, and limited disturbance in all Class

II streams. Other applications of the FPRs and Water Code are not in place. Thus, the claim that protections are in place is not supported by the record.

Other species, NSO, great blue heron, red tree vole, pigmy owl, sharp, red or golden eagle, and even bald eagle have been seen in the area of the THP (with reasonable frequency) - and where observance of these animals has been noted in previous THPs.

No accomplished botanical survey on a 900 acre plan? This is not appropriate.

Late Successional Forest Stands marked NO. Of course not, this property has been over-harvested.

Item 37: Growth and Yield Data. Recent history indicates that the owner Roger Burch (Family), and RMB Revocable Family Trust owns numerous parcels in northern California. This parcel, plus ownership just purchased Lyme Redwood holdings, and other parcels. An accounting of total ownership acres must be accomplished to assess conformance with Sustained Yield Planning requirements.

Item 38: Water Quality Requirements. As stated above, the plan, as written, is not consistent with the regional water quality control plan (Basin Plan).

Pre-consultation document: Noted by CGS and RPF, there are specific dormant landslide areas and unstable areas, areas subject to potential and active erosion (inclusive of the ground adjacent to no-name creek – S2/WH 1). Specific protections – e.g buffers, logging exclusion, changes in silviculture, and overstory maintenance considerations need to be addressed in this plan on a site specific basis.

Section(s) III, and IV of the plan note Watershed Conditions. However, stream function impairment (and impaired listing) for temperature effects is not addressed in the plan. A conclusion is made that stream assessment and related application of ASP is sufficient to deal with temperature issues, with no discussion of the impairment and how applied protections will actually remedy the issue. Additionally, a number of side streams, adjacent to the mainstem, are essential temperature modulated areas used by salmonids during low flow periods and when thermally threatened. Acknowledgement of these conditions, proper stream identification, and application of standards that will assure no negative temperature effects (with monitoring) must be part of this plan. Note: the Basin Plan (including NPS policy) and the Garcia TMDL mandate control of all controllable sources of pollutants.

Road Maintenance : The plan calls for road and landing maintenance during operations and throughout the prescribed maintenance period. There are no noted standards for monitoring requirements (frequency, timing, duration). Similarly the same issue arises with appurtenant roads and historic structures. There must be more comprehensive description of such monitoring and maintenance practices (Garcia River TMDL and ECP).

The RPF Certified – that this plan poses no effect on the environment – and that the Plan complies with the FPRs and other regulations. At this point in the plan review and approval process, the RPF cannot support such certification.

These comments, as presented, have raised substantial issue that must be addressed by the Review Team and the lead agency, Calfire. Failure to address these issues would be an act inconsistent with the regulatory framework and requirements within that framework; CEQA, Forest Practice Act, Cal Water Code (regional Basin Plan), Fish and Game Code, Coastal Act, and the federal Endangered Species Act.

I look forward to agency review and your response.

Alan Levine , for Coast Action Group

APPENDIX

Point Arena Mountain Beaver Recovery Plan (link included)

Site Specific Management Plan (requirements – from Garcia TMDL Implementation – Basin Plan)

Elements of a Site-Specific Management Plan

1. Description of Land Management Measures to Control Sediment Delivery

A Site -Specific Management Plan shall include a description of, and schedule for, the Land Management Measures the landowner proposes to implement to control the future delivery of sediment from the following land management activities:

- Roads, landings, skid trails, watercourse crossing construction, reconstruction, maintenance, use, and obliteration;
- Operations on unstable slopes;
- Use of skid trails and landings;
- Use of near stream facilities, including agricultural activities; and
- Gravel mining.

In addition, the description must include:

- A Long-term Road System Plan (Road Plan) similar to that described below in the Garcia River Management Plan, and

- Supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding measures of the Garcia River Management Plan.

2. Description of Land Management Measures to Improve the Condition of the Riparian Management Zone

The Site- Specific Management Plan shall include a description of, and schedule for, the

Land Management Measures and any restoration activities the landowner proposes to improve or maintain the condition of the Riparian Management Zone such that it provides:

- Stream bank protection,
- Filtering of eroded material prior to its entering the watercourse channel, and
- Recruitment of large woody debris to the watercourse channel and flood plain.

In addition, the description shall include supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding riparian measures of the Garcia River Management Plan.

B. Nonpoint Source Policy

Many water bodies in the North Coast Region are impaired by nonpoint sources (NPS) of pollution, such as sediment discharges and elevated water temperatures. Therefore, many of the following TMDL action plans focus on NPS pollution control.

The Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy)¹⁴ is a state-wide policy that explains how existing permitting and enforcement tools will be used to address nonpoint sources of pollution. The NPS Policy states that all current and proposed NPS discharges must be regulated under waste discharge requirements (WDRs), waivers of WDRs, a basin plan prohibition, or some combination of these tools.

A NPS pollution control implementation program is a program developed to comply with WDRs, waivers of WDRs, or basin plan prohibitions. A NPS pollution control implementation program must contain five key elements, which are summarized as follows:

Key Element 1: Explanation of the purpose of the NPS pollution control implementation program and how it will meet water quality standards.

Key Element 2: Description of the management practices and other program elements that are to be used to meet water quality standards and an evaluation that ensures proper implementation.

Key Element 3: A time schedule with quantifiable milestones.

Key Element 4: Adequate monitoring.

Key Element 5: The potential consequences for failure.

Recovery Plan for the Point Arena Mountain Beaver

Aplodontia rufa nigra (Rafinesque)

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**COAST AREA OFFICE
RESOURCE MANAGEMENT**



POINT ARENA MOUNTAIN BEAVER

Aplodontia rufa nigra (Rafinesque)

RECOVERY PLAN

Prepared by

Dale T. Steele

and

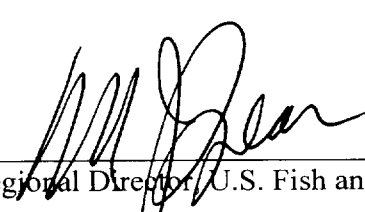
Laurie Litman

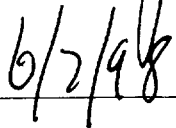
for

Region 1

U.S. Fish and Wildlife Service

Portland, Oregon

Approved: 
Regional Director, U.S. Fish and Wildlife Service

Date: 

Disclaimer

Recovery plans delineate reasonable actions which are believed to be required to recover and/or protect listed species. Plans are published by the U.S. Fish and Wildlife Service, sometimes prepared with the assistance of recovery teams, contractors, State agencies, and others. Objectives will be attained and any necessary funds made available subject to budgetary and other constraints affecting the parties involved, as well as the need to address other priorities. Costs indicated for task implementation and/or time for achievement of recovery are only estimates and subject to change. Recovery plans do not necessarily represent the views nor the official positions or approval of any individuals or agencies involved in the plan formulation, other than the U.S. Fish and Wildlife Service. They represent the official position of the U.S. Fish and Wildlife Service ***only*** after they have been signed by the Regional Director or Director as ***approved***. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks.

Literature Citation should read as follows:

U.S. Fish and Wildlife Service. 1998. Point Arena Mountain Beaver (*Aplodontia rufa nigra* (Rafinesque)) Recovery Plan. Region 1, Portland, OR. 71 pp.

Additional copies may be purchased from:

Fish and Wildlife Reference Service
5430 Grosvenor Lane, Suite 110
Bethesda, Maryland 20814
301/492-3421 or 1-800-582-3421

The fee for the Plan varies depending on the number of pages of the Plan.

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The cover drawing is used courtesy of the California Wildlife Habitat Relationships Program, California Department of Fish and Game, Wildlife Management Division from: D.C. Zeiner, W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1990. California's Wildlife, Vol. III, Mammals. California Statewide Wildlife Habitat Relationships System. State of California, The Resources Agency, Department of Fish and Game, Sacramento, California.

Executive Summary

Current Species Status: The Point Arena mountain beaver (*Aplodontia rufa nigra*) is a federally listed endangered subspecies. This subspecies of mountain beaver is only known from a small area of coastal Mendocino County, California, where 26 apparently separate populations have been found, with an estimated 200 to 500 animals total. Potential threats to the habitat of the species include elimination or degradation from land development, grazing, timber harvest, and invasion by alien plant species. Direct threats to the subspecies may include predation by household pets and feral animals, poisoning, genetic isolation and genetic drift, and human caused disturbance. Basic biological data are lacking to determine the level of vulnerability of the mountain beaver to each of these factors.

Habitat Requirements and Limiting Factors: *A. r. nigra* requires a cool moist environment. It lives in underground burrow systems under dense stands of perennial vegetation where soil conditions allow for easy excavation.

Recovery Objective: The ultimate objective of this plan is to delist the Point Arena mountain beaver, however, criteria for downlisting to threatened are also established.

Recovery Criteria: The species will be considered for downlisting when:

1. At least 16 populations are protected from human-caused disturbance in perpetuity. Each population shall contain at least 20 hectares (49 acres) of suitable habitat of which at least 10 hectares (25 acres) are occupied habitat.
2. These populations shall have a mean density of at least 4 Point Arena mountain beavers per hectare (1.6 per acre) of occupied habitat, unless new data show that a lower density is healthy and stable.
3. All 16 populations are stable (i.e., no more than a 25 percent change in estimated population size from highest to lowest value) or increasing for a period of at least 10 years (following attainment

of criterion #1), as documented through establishment and implementation of a scientifically acceptable population monitoring program.

4. The amount of additional habitat needed for population interconnectivity, travel, and dispersal habitat has been determined.
5. Sufficient information is available to permit adaptive management, and any management actions necessary to ensure the continued success of these populations (in criterion #1) have been fully implemented.

The species will be considered for delisting when:

1. Thirty populations are protected from disturbance in perpetuity. Each population shall contain at least 20 hectares (49 acres) of suitable habitat of which at least 10 hectares (25 acres) are occupied habitat.
2. These populations shall have a mean density of at least 4 Point Arena mountain beavers per hectare (1.6 per acre) of occupied habitat, unless new data show that a lower density is healthy and stable.
3. All 30 populations are stable (i.e., no more than a 25 percent change in estimated population size from highest to lowest value) or increasing for a period of at least 15 years (following attainment of criterion #1), as documented through establishment and implementation of a scientifically acceptable population monitoring program.
4. Additional habitat needed for population interconnectivity, travel, and dispersal habitat has been protected and is being managed appropriately.
5. Adaptive management prescriptions have been determined and implemented for all populations.

Actions Needed:

1. Protect known populations.
2. Protect suitable habitat, buffers, and corridors.
3. Develop management plans and guidelines.

4. Gather biological and ecological data necessary for conservation of the subspecies.
5. Determine feasibility of, and need for, relocation.
6. Monitor existing populations and survey for new ones.
7. Establish an outreach program.

Estimated Cost of Recovery: \$1,047,000+. The total cost of this recovery effort could be higher than this figure. The costs for several tasks needed for recovery have yet to be determined.

Date of Recovery: Downlisting could be initiated in 2015 and delisting by 2025.

Table of Contents

I. Introduction	1
A. Description	1
B. Geographical Distribution	2
C. Habitat	5
D. Life History/Biology/Ecology	12
Burrows	12
Population Density	14
Nest	15
Burrow Community	15
Cleanliness	16
Foraging	17
Activity	18
Thermoregulation	19
Osmoregulation	20
Behavior	20
Senses	21
Demographics	22
Fragility	24
Pest Control	25
E. Reasons for Listing and Threats to Survival	26
F. Conservation Measures	31
II. Recovery	34
A. Objective and Criteria	34
Downlisting criteria	34
Delisting criteria	35
B. Stepdown Narrative	36
C. Literature Cited	52
D. Personal Communications	60
E. <i>in lit.</i> References	61
III. Implementation Schedule	62
IV. Appendix A: Summary of Comments	67

List of Figures

Figure 1. Distribution of known <i>Aplodontia rufa</i> subspecies	3
Figure 2. Distribution of known Point Arena mountain beaver populations	8

List of Tables

Table 1. Museum specimens of the Point Arena mountain beaver	4
Table 2. Known populations of the Point Arena mountain beaver	6
Table 3. Chronology of research on the Point Arena mountain beaver	13

I. Introduction

A. DESCRIPTION

The Point Arena mountain beaver (*Aplodontia rufa nigra*) was listed as a federally endangered species by the U.S. Fish and Wildlife Service on December 12, 1991 (50 **FR** 64716). It is also listed as a highest priority “Species of Special Concern” by the State of California (Williams 1986). This subspecies has been given a recovery priority number of 3 given that it is faced with a high degree of threat and has a high recovery potential.

The first published account of mountain beaver, *Aplodontia rufa* (Rafinesque), comes from the journals of Lewis and Clark in 1805 (Godin 1964). The Point Arena subspecies was originally described by Taylor (1914) as a separate species, *Aplodontia nigra*, because of its unique color and certain anatomical features. It was later revised to subspecies status, *Aplodontia rufa nigra*, due to overlap of characteristics with other subspecies and lack of representative specimens (Taylor 1918). This classification has been upheld through several revisions (Dalquest and Scheffer 1945, Hall and Kelson 1959, Hall 1981). A considerable degree of geographical and individual variation exists within subspecies of *Aplodontia* (Dalquest and Scheffer 1945). Isolation is probably a major factor in the speciation (*i.e.*, the process of differentiation into species and subspecies) of the genus (Finley 1941).

The mountain beaver has been compared to an overgrown pocket gopher (Ingles 1965) and a muskrat without a tail (Racy 1922). Its body is stout, compact and cylindrical. An average adult measures slightly more than 30.5 centimeters (1 foot) in length and weighs 0.8 to 1.8 kilograms (2 to 4 pounds) (Feldhamer and Rochelle 1982). The skull is relatively broad, massive, laterally compressed, and notable for its flat upper surface and lack of postorbital processes (spur of bone above the eye socket) (Hall 1981). Long, stiff whiskers (vibrissae) are present on the nose, and guard hairs are plentiful in the fur. A little patch of white hair occurs at the base of each ear. The eyes and ears are quite small. Limbs are short, the fore and hind limbs of about equal length. The forefeet have functionally

opposed thumbs, and all digits have long, curved claws. A distinctive feature of its external anatomy is its cylindrical stump of a tail.

Several characteristics distinguish the Point Arena mountain beaver from other subspecies. The most obvious is its unique black coloration. The outline of the nasals is also distinctive, as are some cranial measurements (Taylor 1914). *A. r. nigra* is also the smallest of the Californian subspecies.

The mountain beaver, also known as sewellel, boomer, and many other names, is not closely related to true beavers (*Castor*). *Aplodontia* are considered to be the oldest group of living rodents, being the sole extant member of the superfamily Aplodontoidea, which has been almost morphologically unchanged in the fossil record since the Miocene (Simpson 1945). This “living fossil” is thought to be ancestral to the squirrel family (Shotwell 1958).

B. GEOGRAPHICAL DISTRIBUTION

The Point Arena mountain beaver is known only from its type locality, an area of about 62 square kilometers (24 square miles), entirely in western Mendocino County (Camp 1918). The seven subspecies of mountain beaver are found in cool, moist climates along the Pacific Coast of North America, from southern British Columbia to Point Reyes, California and east to the Cascade and Sierra Nevada Ranges (Scheffer 1929) (Figure 1). Four subspecies are found along the northern coast of California—the Humboldt mountain beaver (*Aplodontia rufa humboldtiana*), the Point Reyes mountain beaver (*A. r. phaea*), the Point Arena mountain beaver (*A. r. nigra*), and the Pacific mountain beaver (*A. r. pacifica*). The Point Arena and Point Reyes subspecies are isolated by considerable distances (Steele 1986). The Point Arena mountain beaver is about 130 kilometers (80 miles) south of the Humboldt mountain beaver, and the Point Reyes mountain beaver is 100 kilometers (60 miles) south of the Point Arena mountain beaver. The length of time these populations have been isolated is not known. Also, note that the Sierra Nevada mountain beaver is not endemic to California, as it has been collected within the Nevada portion of the Tahoe Basin.

Historical records of *A. r. nigra* are scarce (Table 1). Camp (1918) reported that

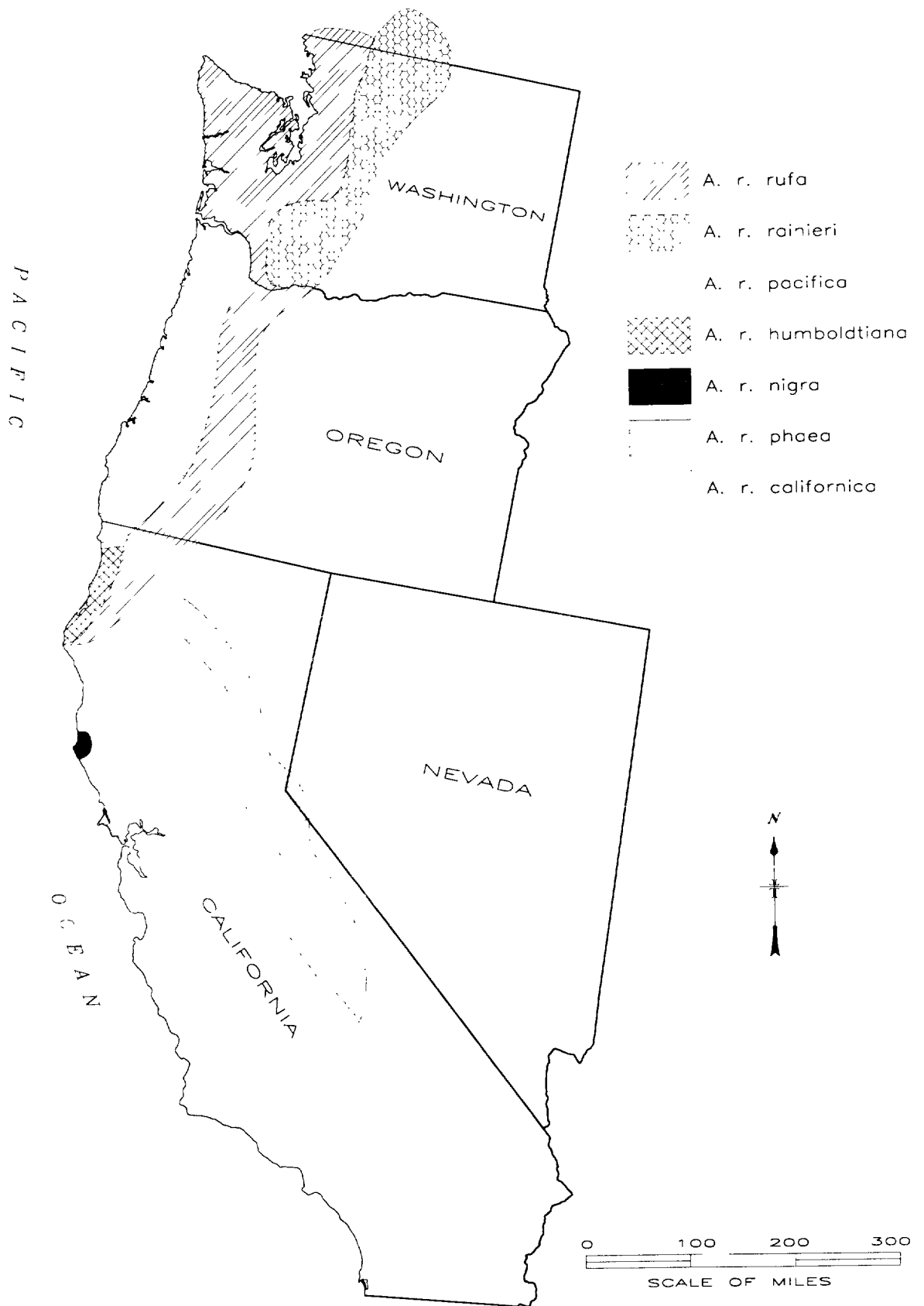


Figure 1. Distribution of known *Aplodontia rufa* subspecies (modified from Godin 1964). ³

Table 1. Museum specimens of the Point Arena mountain beaver.

Collector	Date	Location	Sex	Age	Weight (grams)	Length (millimeters)	Skin	Skull	Skeleton	Museum	Comments
C.L. Camp	7-9-13	Point Arena or Alder Creek	Male	Unknown	Unknown	310 mm	X	X	Complete	University of California at Berkeley, Museum of Vertebrate Zoology	Type specimen
C.L. Camp	7-9-13	Point Arena or Alder Creek	Male	Unknown	908+ g	316 mm	X	X	Partial	University of California at Berkeley, Museum of Vertebrate Zoology	
C.L. Camp	7-9-13	Point Arena or Alder Creek	Unknown	Unknown	Unknown	Unknown				University of California at Berkeley, Museum of Vertebrate Zoology	Foot only
C.L. Camp	7-10-13	Point Arena or Alder Creek	Unknown	Unknown	Unknown	Unknown	X	X	Partial	University of California at Berkeley, Museum of Vertebrate Zoology	Type specimen
C.L. Camp	7-11-13	Point Arena or Alder Creek	Male	Unknown	908 g	325 mm	X	X	Complete	University of California at Berkeley, Museum of Vertebrate Zoology	Type specimen
T. Storer	7-13-31	Alder Creek?	Female	Unknown	Unknown	328 mm				University of California at Berkeley, Museum of Vertebrate Zoology	
D.H. Johnson <i>et. al</i>	12-32	Unknown	Unknown	Unknown	Unknown	Unknown		X	None	University of California at Berkeley, Museum of Vertebrate Zoology	
W.F. and F. Wood	3-4-39	Point Arena	Male	Adult	Unknown	316 mm	X	X	X	Carnegie Museum of Natural History	Age based on curator evaluation of tooth eruption and fusion of skull sutures
W.F. and F. Wood	8-23-39	Point Arena	Female	SubAdult	Unknown	306 mm	X	X	X	Carnegie Museum of Natural History	Age based on curator evaluation of tooth eruption and fusion of skull sutures
W.F. and F. Wood	8-23-39	Point Arena	Female	Adult	Unknown	306 mm				Carnegie Museum of Natural History	Age based on curator evaluation of tooth eruption and fusion of skull sutures
E.W. Pfeiffer	9-3-51	Christensen Ranch (near Bridgeport Landing)	Female	Unknown	1069 g	307 mm	X	X	None	University of California at Berkeley, Museum of Vertebrate Zoology	Reproductive research
E.W. Pfeiffer	11-25-51	Christensen Ranch	Female	Unknown	1045 g	333 mm	X	X	None	University of California at Berkeley, Museum of Vertebrate Zoology	Reproductive research
B. Jones	4-89	2 miles east of Point Arena	Female	Unknown	Unknown	Unknown	X	X	Complete	University of California at Berkeley, Museum of Vertebrate Zoology	Tissue collected and preserved
B. Jones	8-89	Point Arena (Kinney Road at Manchester Beach State Park)	Female	Unknown	Unknown	Unknown	X	X	Complete	University of California at Berkeley, Museum of Vertebrate Zoology	Tissue collected and preserved
K. Fitts	3-29-94	Hwy 1 - Kinney Road	Female	Unknown	495 g	310 mm	X	X		Sonoma State University Vertebrate Museum	Hit by car

NOTES: Data results from contacting more than 50 museums and universities and reviewing data on over 1,000 mountain beaver specimens.

“colonies” extend from the town of Point Arena to Alder Creek, 12 kilometers (7.5 miles) to the north. This range was extended north another 7 kilometers (4.5 miles) when animals were collected at Christianson Ranch in 1951 by Pfeiffer. In 1991, when the species was listed as endangered, 10 populations had been located at Mallo Pass Creek, Irish Gulch, Alder Creek, Manchester Beach State Park, Lagoon Lake, Lower Hathaway Creek, and Point Arena (U.S. Fish and Wildlife Service 1991). Currently, at least 26 apparently separate populations are known (Table 2), including populations along Mills Creek, Mallo Pass Creek, Irish Gulch, Alder Creek, Manchester Beach State Park, Lagoon Lake, Lower Hathaway Creek, Point Arena, lower and middle Brush Creek, and Hathaway Creek (Figure 2). The size of the total known population is roughly estimated to be 200 to 500 animals (D. Steele, T. Wooster, unpublished data).

C. HABITAT

Mountain beaver live in underground burrow systems with openings under vegetation (Scheffer 1929), often on steep north-facing slopes or in gullies (Steele 1986). The burrows are found in moist areas with well-drained soil (Ingles 1965). Studies suggest that the most important factors in habitat use are a cool thermal regime, adequate soil drainage, and abundant food supply (Beier 1989), a high percent cover of small diameter woody material, and soft soil (Hacker and Coblenz 1993). Mountain beaver require large amounts of lush vegetation for survival (Voth 1968). Distribution limits are associated with rainfall and soil conditions that promote lush vegetation and high humidity within burrows (Voth 1968).

Within the range of the Point Arena mountain beaver, the historical conversion of heavily forested areas to agriculture, including cattle grazing, may have altered the distribution of populations (T. Wooster *in litt.* 1997). To date, no burrow systems of the Point Arena mountain beaver have been found in a forest setting of large trees with large root systems (T. Wooster *in litt.* 1997). One burrow system was found in Mills Creek where several of the entrances were found under the live roots of a redwood tree, but the remainder of the system was away from the tree in open, low vegetation (T. Wooster *in litt.* 1997). Studies done on Oregon subspecies of mountain beaver (Humboldt mountain beaver and Pacific mountain

Table 2. Known populations of the Point Arena mountain beaver.

POPULATION ID #	SITE	AREA (ha)	TOTAL # BURROWS ¹	HABITAT TYPE ²	POTENTIAL THREATS	OWNERSHIP	ESTIMATOR	YEAR	COMMENTS
1	Bridgeport Landing			CS		Private			Possible easement
2	Mills Creek	0.02	20+	Nettles, Herbs	Grazing, Fire, Timber Harvest	Private	Wooster	1992, 1994, 1996, 1997	
3	Mallo Pass Creek	1.50	55+	CS, ferns	Water Diversion, Roads, Fire	Private	Steele, Booth, Wooster, Shively	1985, 1986, 1987, 1992, 1993, 1994, 1996, 1997	
4	Irish Gulch	1.50	50	R, C	Housing Development, Feral Pets, Roads, Trails	Private	Steele, Wooster, McKay	1981, 1985, 1986, 1994, 1997	
5	Bluff between Irish Gulch and Alder Creek	0.50	NA ⁴	CS	Grazing ³ , Fire	CDPR ⁵	Wooster	1992, 1994, 1997	"Riddled with burrows"
6	Alder Creek, 1st north tributary (Owl Creek)	0.05	NA	NA	Grazing, Timber Harvest, Fire	Private	Wooster	1992, 1997	Two small sites
7	Alder Creek, 2nd north tributary (Wildcat Creek)	0.13	74+	Alder, ferns	Grazing, Timber Harvest, Fire	Private	Wooster	1992	Three small sites
8a	Alder Creek	2.90	100+	CS, R	Grazing, Roads, Herbicides, Foot Traffic	CDPR, Private	Steele, Wooster	1981, 1985, 1986, 1993, 1994, 1996	Fault area
8b	Alder Creek (MCI Study site)	2.12 ⁶	324 ⁷	CS	Fire, Mud Slides, Human Access	CDPR	Fitts	1997	MCI Monitoring, Robust population
9a	Manchester Complex (Manchester Beach)	0.75	18	CS, CSt	Campground, Feral Pets, Roads, Trails	CDPR	Steele	1989, 1994	Pedestrian impacts
9b	Manchester Complex (Davis Pond)	0.50	40	CS, CSt	Human Access	CDPR	Steele	1985, 1989	Skull found
9c	Manchester Complex (AT&T Facility)	1.50	250+	CS, CSt	Construction, Human Access, Operation and Maintenance, Storm Damage	CDPR, Private	Steele	1985, 1989, 1996	MCI Monitoring
9d	Manchester Complex (AT&T Facility, MCI Study site)	2.70	272 ⁷	CS, CSt	Fire, Operation and Maintenance, Feral Pets, Human Access	Private	Fitts	1997	MCI Monitoring, Point Arena mountain beaver utilizing ice plant
9e	Manchester Complex (Kinney Road, MCI Study site)	1.93 ⁸	237 ⁷	CS, CSt	Fire, Trails, Feral Pets, Human Access	CDPR	Fitts	1997	MCI Monitoring
9f	Manchester Complex (KOA Campground)	0.10	NA	CS	Pets, Fire	CDPR	Steele	1986	Small site
10	Middle Brush Creek	2.90	NA	R	Pets, Herbicides, Streambed Disturbance	Private	Steele ⁹ , Wooster	1981, 1992, 1997	

POPULATION ID #	SITE	AREA (ha) ¹	TOTAL # BURROWS ²	HABITAT TYPE ³	POTENTIAL THREATS	OWNERSHIP	ESTIMATOR	YEAR	COMMENTS
11	Lagoon Lake	0.75		CS	Feral Pets, Fire, Trunks	CDPR	Steele	1985-1986	Recent fire
12	Lagoon Creek	2.20	NA	CS	Grazing, Utility Corridor, Fire	Private	Steele	1992	
13	Lagoon Creek, south tributary	5.30	NA	CS	Grazing, Utility Corridor, Fire	Private	Steele	1992	
14	Garcia River, 3rd south tributary	2.36	NA	CS, R	Grazing, Fire	Private ⁴	Steele, Wooster	1992-1993, 1994-1997	
15	Garcia River, 2nd south tributary	2.00	NA	CS, R	Grazing, Fire	Private ⁴	Steele	1992	
16	Lower Hathaway Creek	1.00	43	CS, R	Feral Pets, Roads, Grazing	Private	Steele, Wooster	1981-1985, 1986-1994, 1996	
17a	Hathaway Creek, 1st south tributary (Levine Property)	0.65	1	CS	Grazing ⁵ , Fire	Private	Steele, Wooster	1994-1995, 1997	Possible easement
17b	Hathaway Creek, 1st south tributary (Atwood Ranch)	1.6	3	R	Water Diversion, Pets, Fire	Private	Litts	1994	Travel corridor
18	Hathaway Creek, 1st north tributary	7.33	22	R, CS	Grazing, Fire	Private	Steele, Wooster, Kelly	1992, 1993, 1994, 1996	Two small sites
19	Upper Hathaway Creek	3.3	NA	CS	Grazing, Fire	Private	Steele, Wooster	1992-1993, 1994-1996, 1997	
20	Point Arena Creek	1.51	50 ⁶	CS	Grazing, Herbicides, Feral Pets, Roads	City of Pt. Arena, Private	Steele, Wooster	1985-1985, 1994	Dog killed Point Arena mountain beaver
21	Garcia River	0.07	30 ⁶	R	Fire, Grazing, Human Access, Floods	Private	Mohr, Wooster	1996, 1997	
22	Spanish Creek	0.7	48 ⁶	CS	None	Private	Wooster	1995-1996	
23	Garcia River, 1st south tributary	5.80	NA	R	Grazing, Fire	Private	Steele	1992	Drifting disturbance
24	Lower Brush Creek	0.10	NA	R	Grazing, Human Disturbance, Streambank Erosion Disturbance	Private	Steele	1981	
25	Garcia River, Windy Hollow Rd	4.82	NA	CS	Cattle Grazing	Private ⁴	Wooster	1997-1998	
26	Mill Creek	0.01	NA	R	Encroachment of dense forest into riparian area	Private	Wooster	1997	

¹ Area (ha) - Area (in hectares) with sign of mountain beaver activity/burrows; ² Total # Burrows - estimation techniques vary (transect line data, rough estimates of burrow numbers).

³ CS=Coastal Scrub, R=Riparian, CSt=Coastal Strand, C=Coniferous; ⁴ NA - Not Available; ⁵ CDPR - California Department of Parks and Recreation; ⁶ Area = total area of study site;

⁷ Area - total number of burrows - total number of active burrows; ⁸ Steele, unpubl. data (1992); ⁹ Wooster, unpubl. data (1992, 1993)

Population ID No.

- 1
- ◻ 2
- ◐ 3
- ⊕ 4
- 5
- △ 6
- ⊙ 7
- ★ 8
- ⊙ 9
- ◻ 10
- ⊗ 11
- ⊙ 12
- × 13
- ⊕ 14
- ⊕ 15
- 16
- 17
- 18
- ⊙ 19
- ▲ 20
- ☆ 21
- 22
- ◆ 23
- 24
- ✱ 25
- 26
- Highway 1
- Watercourses



*PACIFIC
OCEAN*

Point
Arena

Garcia River

Point Arena

Mallo Pass Creek

*Alder
Creek*

*Brush
Creek*

Figure 2. Known distribution of Point Arena mountain beaver, Mendocino County, California (California Department of Fish and Game, Point Arena Mountain Beaver Database, 1998).

1 0 1 2 3 Miles

Prepared by: CDFG - G. Gould - 4/7/98

beaver), have confirmed that populations are very low in dense conifer stands (Hooven 1973). Brushy openings in stands provide suitable habitat that often supports populations of these subspecies (Hooven 1973).

Populations of the Point Arena mountain beaver are found in a variety of habitat types including coastal scrub, coastal strand, conifer forest, and riparian plant communities (Steele 1986). The vegetation at the Point Arena, Lower Hathaway Creek, Lagoon Lake, Alder Creek, and Mallo Pass Creek sites is coastal scrub. Common coastal scrub species include cow parsnip (*Heracleum lanatum*), coyote brush (*Baccharis pilularis*), wax myrtle (*Myrica californica*), California blackberry (*Rubus ursinus*), salmonberry (*R. spectabilis*), and thimbleberry (*R. parviflorus*). Riparian vegetation is present at several population locations. Common species include skunk cabbage (*Lysichitum americanum*), horsetail (*Equisetum telmateia*), willows (*Salix lasiolepis* and *S. sitchensis*), red alder (*Alnus rubra*), wood rose (*Rosa gymnocarpa*), and California blackberry. The Irish Gulch site has a conifer overstory with Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), and Bishop pine (*Pinus muricata*). The understory includes elements of both riparian and coastal scrub habitats, including thimbleberry, stinging nettle (*Urtica* sp.), sword fern (*Polystichum munitum*), salmonberry, and elderberry (*Sambucus* sp.).

At least three mountain beaver sites at Manchester Beach State Park occupy a habitat type that differs from that of other populations (Steele 1986). These populations are found in stabilized dunes dominated by bush lupine (*Lupinus arboreus*) and other coastal strand species including coyote brush, coast goldenrod (*Solidago spathulata*), dune grasses, and ice plant (*Carpobrotus* sp.). The soil on these dunes is more stabilized and compacted than that found on open dunes, there is substantially more ground cover, and burrow openings are found under shrubs. These sites offer less cover, fewer food plants, and poorer burrowing conditions than other *A. r. nigra* sites, but these small populations seem to have persisted over 10 years of observation (D. Steele pers. obs.).

A recently discovered population (population i.d. #21 in Table 2), on the south side of the Garcia River, is about 15 meters (50 feet) from the river, between a riparian zone dominated by red alder and California laurel (*Umbellularia*

californica), and a hill slope forested with redwood (*Sequoia sempervirens*) and grand fir. The colony area is covered by dense, 1.0 to 1.2 meters (3 to 4 feet) high vegetation dominated by cow parsnip, stinging nettle, horsetail (*Equisetum arvense*), and California blackberry. Shrubs of cascara (*Rhamnus purshiana*) and coyote brush surround the site on all but the north side (A. Mohr pers. comm. 1996).

Large areas of seemingly suitable habitat are unoccupied by mountain beaver. Camp (1918) noted that (in observations of the Point Reyes mountain beaver) "overcrowded conditions may prevail in one place, while territory of the same character remains unoccupied nearby".

In their 5-year study of Point Arena mountain beaver, Northen and Fitts (1993, 1998) investigated the types of vegetation found in association with this subspecies. In their studies, vegetative factors were analyzed in terms of their relationship with total burrows at three sites: Alder Creek, Kinney Road, and the AT&T site.

Results indicated that burrows are most common in moderately tall vegetation of mesic sites; presence of burrows correlated significantly with plant height on all sites. According to Northen and Fitts (1993), a grouping of short plants on the southern portion of Alder Creek was negatively correlated with burrows, but many of the plant species were positively associated with each other, including California poppy (*Eschscholzia californica*), spring vetch (*Vicia sativa*), English plantain (*Plantago lanceolata*), sheep sorrel (*Rumex acetosella*), and geranium (*Geranium* spp.).

Overall, the Kinney Road study site (Northen and Fitts 1993) showed the largest number of plant species that strongly correlated both positively and negatively with mountain beaver activity, suggesting that the environmental gradient is steeper between "good" and "bad" habitat on this site than the two other sites. Positive association was observed with Pacific reedgrass (*Calamagrostis nutkaensis*), coyote brush, yellow bush lupine, all tall perennials, and many smaller associate species. Northen and Fitts (1993) speculate that the larger plants help establish a "microclimate" in which some smaller food plants grow (e.g.,

miner's lettuce (*Claytonia perfoliata* spp. *perfoliata*)).

Northen and Fitts (1993) revealed that at least two different associations of taller plants support mountain beaver; an area dominated by California reedgrass on Kinney Road, and an area having moist coastal bluff associates on Alder Creek. Northen and Fitts (1993) hypothesize that the Point Arena mountain beaver is more restricted to plant species *per se*, than to the soil and climatic conditions that favor such plant associations.

In their 1997 study, Northen and Fitts (1998) found that bugle hedge nettle (*Stachys ajugoides* var. *rigida*) seemed to be a preferred plant, and was common on all three study sites. Bush lupine and seaside woolly sunflower (*Eriophyllum staechadifolium*) were also found to be frequently utilized by the mountain beaver. The data from their 5-year study show that populations have increased on sparsely vegetated coastal strand on the AT&T site. Here, bush lupine, coyote brush, ice plant, and wild radish (*Raphanus sativus*), as well as various grasses, have been found to be important for cover, and possibly for nesting material and food.

Other rare animal and plant species may occur in the vicinity of Point Arena mountain beaver habitat. These species are birds, including the western snowy plover (*Charadrius alexandrinus nivosus*), marbled murrelet (*Brachyramphus marmoratus*) (B. Valentine *in litt.* 1997), and northern spotted owl (*Strix occidentalis caurina*) (B. Valentine *in litt.* 1997); amphibians, including the foothill yellow-legged frog (*Rana boylei*); fish, including the tidewater goby (*Encyclogobius newberryi*), Central California coast coho salmon (*Oncorhynchus kisutch*) (B. Valentine *in litt.* 1997), and Northern California steelhead trout (*Oncorhynchus mykiss*) (B. Valentine *in litt.* 1997); invertebrates, including Behren's silverspot butterfly (*Speyeria zerene behrensii*); and plants, including swamp harebell (*Campanula californica*), Mendocino Coast Indian paintbrush (*Castilleja mendocinensis*), coast lily (*Lilium maritimum*) (S. Flowers *in litt.* 1997), maple-leaf sidalcea (*Sidalcea malachroides*) (S. Flowers *in litt.* 1997), fringed false-hellebore (*Veratrum fimbriatum*) (S. Flowers *in litt.* 1997), pink sand verbana (*Abronia umbellata*) (S. Flowers *in litt.* 1997), and Blasdale's bent grass (*Agrostis blasdalei*) (S. Flowers *in litt.* 1997).

D. LIFE HISTORY/BIOLOGY/ECOLOGY

Little research has been done on the Point Arena mountain beaver. The only historical records available are from Taylor (1914 and 1918), who first described the subspecies; Camp (1918), who made some natural history observations; and Pfeiffer, who in 1951 captured two animals for reproduction studies (Table 3). Some basic surveying and monitoring have been done since 1982. Most studies have been conducted on the more abundant subspecies of *Aplodontia rufa*, primarily those in Oregon and Washington. Nevertheless, knowledge of the biology and ecology of the genus is limited and often based solely on anecdotal records. Given its ancient lineage, unusual physiological characteristics, unique food niche and fascinating behavior, this amazing animal could provide insights in a variety of fields.

Burrows

Mountain beaver are seldom seen, being most often identified by extensive underground burrow systems that have numerous openings to the outside (Taylor 1914, Camp 1918). These openings are approximately 15 centimeters (6 inches) in diameter and occur every few feet (Racy 1922). Burrows are usually in moderately firm soil where digging is easy, but mountain beaver have been known to dig in other soil types, even sticky clay (Hubbard 1922). Tunnels generally run within 0.3 meter (1 foot) of the surface, but sometimes descend to depths of 1 to 1.5 meters (3 to 5 feet) (Racy 1922, Martin 1971). Burrow systems vary in size. Camp (1918) reported a burrow system of *A. r. phaea* that extended for more than 100 meters (330 feet) in one direction. The burrow territory of a single animal, however, probably does not exceed 25 meters (80 feet) (Voth 1968). Burrow excavations have shown that mountain beaver burrows contain narrow tunnels (Ingles 1965) that seem to be related to animal size, so that the whiskers can reach both sides (Voth 1968). Tunnels seem to meander with no apparent plan (Scheffer 1929). The direction, extent, and placement of runways and openings is determined by external factors such as obstructions, soil composition, bank slope, etc. (Scheffer 1929). Burrow openings may be used for entrance and exit, for pushing out excavated earth or debris, or may result from erosion or cave-ins (Scheffer 1929). Burrow activity decreases in the winter (Scheffer 1929).

Table 3. Chronology of research on the Point Arena mountain beaver.

Author	Reference	Year	Comments
Taylor, W.	A previously undescribed <i>Aplodontia</i> from the middle north coast of California. University of California Publications in Zoology 12:297-300.	1914	Taxonomy
Camp, C.	Excavations of burrows of the rodent <i>Aplodontia</i> with observations on the habits of the animal. University of California Publication in Zoology 17(18):517-535.	1918	Natural history observations, specimens collected
Pfeiffer, E.	The reproductive cycle of the female mountain beaver. Journal of Mammalogy 39(2):223-235.	1958	Reproduction, specimens collected
Steele, D.	An ecological survey of mountain beaver (<i>Aplodontia rufa</i>) in California. Non-game Wildlife Investigations, Job IV-16.1, California Department of Fish and Game.	1982	Preliminary survey based on museum records
Steele, D.	A review of the population status of the Point Arena mountain beaver (<i>Aplodontia rufa nigra</i>). Final Report No. 10188-5671-5, U.S. Fish and Wildlife Service, Sacramento Endangered Species Office.	1986	Population surveys
Steele, D.	An ecological survey of the Mountain Beaver (<i>Aplodontia rufa</i>) in California, 1970-83. Wildlife Management Division Administrative Report No. 89-1.	1989	Revision of 1982 report
Northen, P. and K. Fitts	Monitoring of the Point Arena mountain beaver for MCI Telecommunications Corp. (Year One through Year Five Reports)	1993 - 1998	5-year mitigation monitoring

Voth (1968) found that mountain beaver cut and store about 2.5 times more food than they eat. However, through part of the winter season or during the full moon, much less is harvested than is eaten, suggesting storage facilities for as much as a 2-week supply of forage. Storage locations are numerous, including outside caches, covered caches, and food chamber caches (Voth 1968).

Mountain beaver are not colonial animals and exhibit little social interaction (Scheffer 1929). The burrows of several animals are often connected, which led early investigators to misname them "colonies" (Camp 1918), a misconception that continues to create confusion. Mountain beaver exhibit a "contagious" distribution, that is, the presence of one or more animals in a given area seems to encourage the settlement of others (Goslow 1964). However, they are solitary animals, except during a short breeding period (Godin 1964).

Mountain beaver are not found in continuous burrow systems, one after the other (T. Wooster *in litt* 1997). Populations are generally found in a "clumpy" distribution (Cafferata 1992) with groups of burrow systems separated by varying distances.

Population Density

There are no hard data available on the density of the Point Arena mountain beaver population. Population estimates are crude, and have been based on observations and conservative counts of approximately 5 to 10 burrow openings per animal. The burrow openings that honeycomb the ground may appear to indicate a large population, but this is probably not the case. Population density is difficult to determine, because several animals may share the same contiguous burrow system with each individual's portion having many openings to the outside. Camp (1918) found a total of 11 *A. r. phaea* in a burrow system measuring 30 by 152 meters (100 by 500 feet), with over 100 burrow entrances. Population estimates have ranged from 0.61 to 0.81 individuals per hectare (0.25 to 0.33 per acre) in studies of *A. r. rufa* and *A. r. pacifica*, respectively (Neal and Borrecco 1981, Lovejoy and Black 1979), to 3.6 to 4 individuals per hectare (1.5 to 1.6 per acre) in a study of *A. r. phaea* (Camp 1918). Temporarily high densities have been estimated at 6.5 per hectare (2.6 per acre) in studies of *A. r. pacifica*

(Voth 1968). At least one small site in Kings County, Washington, had a mountain beaver density of 14 per hectare (5.7 per acre) (Morris *et al.* 1995).

Nest

There are five types of underground chambers within mountain beaver burrows—nest, food, refuge, fecal pellet, and earth ball storage (Voth 1968). The nest is an enlarged chamber, often 50 to 60 centimeters (20 to 25 inches) in diameter and 36 centimeters (14 inches) high, and is usually deeper than other parts of the burrow (Voth 1968). Nests used by adults may contain as much as 0.3 square meter (1.2 square feet) of vegetative material, while subadult nests contain less (Martin 1971). Voth (1968) found differences between the nests of males and females, both in nesting material and the fact that female nests had fewer parasites. Nests are constructed of two shells—an outer shell of coarse vegetation and an inner shell with soft, dry vegetation (Martin 1971). Only one animal lives in a nest (Hubbard 1922, Martin 1971).

Mountain beaver spend about 75 percent of their time in the nest chamber (Ingles 1959, Kinney 1971). The burrow system and nest chamber offer a cool, moist refuge in the summer and a warm and protected environment during the winter (Johnson 1971).

Burrows also contain earth ball storage chambers in which "mountain beaver baseballs" are stored (Voth 1968). These "baseballs" are rocks or lumps of hard clay encountered while digging. They usually weigh about 80 to 200 grams (3 to 7 ounces). They may be used for two purposes: 1) to close nest-feeding chambers during the animal's absence, and 2) to provide abrasive material to trim their incisors (Camp 1918, Voth 1968).

Burrow Community

Mountain beaver burrow systems support a community of vertebrates and other animals (Scheffer 1945). Skunks, salamanders, moles, voles, shrews, chipmunks, ground squirrels, mice, woodrats, gophers, weasels, mink, hares, and brush rabbits have all been recovered from mountain beaver burrows (Pfeiffer 1953, Voth 1968,

Whitaker *et al.* 1979, Maser *et al.* 1981). These animals may have been present as commensals, predators, or by accident.

A unique invertebrate fauna also associates with mountain beaver. Perhaps the most striking example is *Hystricopsylla schefferi*, the largest flea in the world, which grows to 9 millimeters (0.5 inch) in length (Scheffer 1929). An invertebrate community also lives in the fecal pellet chambers and aids in decomposition (Voth 1968). Several species of host-specific mites are associated with mountain beaver (Whitaker *et al.* 1979). Other parasites include ticks and tapeworms (Canaris and Bowers 1992). Neither lice (Scheffer 1969) nor nematodes (Canaris and Bowers 1992) have been identified from mountain beaver. The parasite community of the Point Arena mountain beaver has not been investigated.

Cleanliness

Mountain beaver are fastidious creatures (Wright 1969) that keep their tunnels clean and free of debris (E. Ingles 1960). Special blind tunnels are used as refuse and fecal chambers (Martin 1971). Unused portions of vegetation are placed with other discarded materials in the refuse chamber (Voth 1968) or pushed out of burrow openings (D. Steele pers. obs).

Defecation is accomplished in a precise manner in which the animal takes each fecal pellet in its mouth as it is extruded from the anus and tosses it with a flip of its head into the fecal pile (Kindschy and Larrison 1961). This is done for 2 to 5 minutes at a time. An average of 40 to 160 pellets during a 24-hour period is produced in the field (Voth 1968). One out of every 10 to 13 pellets is reingested directly as it is expelled (Ingles 1961). These special pellets are soft, green and larger than the brown, hard pellets which are discarded. The function of this coprophagy is not known, but it may allow maximum use of nutrients and vitamins contained in the food (Ingles 1961). A number of other rodents, as well as rabbits and hares, also form a special kind of feces from the contents of the caecum (the blind pouch which forms the beginning of the large intestine) which is reingested directly from the anus (Schmidt-Nielsen 1975). Studies have shown that coprophagy in these other animals has great nutritional importance, providing

vitamins, and increasing digestibility, protein utilization, and nitrogen retention.

Foraging

Mountain beaver are strict herbivores (Ingles 1965). They are known to eat a wide range of plant species, which often includes just about all the species within reach of the burrows (Camp 1918, Scheffer 1929). Herbaceous plants are eaten whole, while woody plants are discarded after the bark has been peeled off for food (Scheffer 1929). Clipped vegetation can often be observed near burrow systems (D. Steele pers. obs.).

Mountain beaver are voracious eaters (E. Ingles 1960). Studies have shown that 73 percent of their active time is spent gathering, handling and eating food (Ingles 1959). They seldom venture far from their burrows, which may open directly into suitable vegetation (Camp 1918, Martin 1971). The animals forage for short distances above ground and then carry or drag the cut vegetative material, which may vary in length from a few inches to several feet, to the burrow (Scheffer 1929). There, the material is cut into short sections at the burrow entrance and carried into the burrow to be eaten or stored (Scheffer 1929, Martin 1971). Animals may eat vegetation outside of the burrow, but most often consume it in feeding chambers, adjacent to the nest (Martin 1971).

While mountain beaver gather many of the plants in their vicinity, there seems to be a decided preference for certain types of plants (Camp 1918, Voth 1968, Allen 1969) including shrubs and smaller trees (Crouch 1968). The coastal mountain beaver subspecies are predominantly fern and root eaters (Camp 1918). Some of their preferred foods include plants that are unpalatable or toxic to other mammals such as bracken fern (*Pteridium aquilinum*), sword fern, stinging nettles, thistles (*Cirsium* spp.), corn lily (*Veratum* sp.), salal (*Gaultheria shallon*), foxglove (*Digitalis purpurea*), larkspur (*Delphinium* sp.), and skunk cabbage (Voth 1968, Lacy 1991). This gives the mountain beaver a largely uncontested food niche (Johnson 1971). This ability to consume plants with such a variety of toxic secondary compounds is unusual and may involve a metabolic “cost” to the animal (Lacy 1991).

Many observers have described a behavior called “haystacking,” in which mountain beaver cut bundles of plants and lay them on logs or on the ground to wilt (Camp 1918, Godin 1964, Voth 1968). Haystacking has generally been assumed to provide dried vegetation for nesting or food storage (Scheffer 1929). Voth (1968), however, suggests that the purpose of haystacking is to regulate the moisture content of the food by mixing wilted with fresh vegetation.

Activity

Aplodontia are mostly nocturnal animals but they are seen in the daytime (Ingles 1959, Wright 1969). During a study by Ingles (1959), mountain beaver exhibited 6 to 7 activity periods in a 24-hour period, with a total of 8 to 9 active hours and 15 to 16 hours of rest. The longest rest period was in the daytime (4.25 hours) and the longest activity period (2.75 hours) at night. This study showed that *Aplodontia* may be active outside its burrow at any hour, but is 50 to 60 percent more active at night (Ingles 1959).

Bright sunlight appears to make *Aplodontia* drowsy (Godin 1964). Mountain beaver have been observed to stop while foraging or even in mid-flight, nod, and then fall asleep in open, unprotected areas. This seemingly nonadaptive “narcolepsy” may be a reaction to bright light, warmth, panic or other conditions (Goslow 1964, D. Steele pers. obs.).

Mountain beaver do not hibernate (Scheffer 1929). They remain active during the winter (Hall and Kelson 1959, Ingles 1965), although activity decreases during this time of year (Voth 1968).

Data from radiotelemetry studies on animals in Washington showed that 90 percent of the animals remain within 24 meters (80 feet) of their nest chamber (Martin 1971). The average home range (the above-ground area in which the animal forages) varies depending on habitat and has been reported as 0.08 to 0.16 hectares (0.2 to 0.4 acre) with no apparent difference in mean ranges of males and females (Martin 1971, Neal and Borrecco 1981). A scrotal male moved 197 meters (350 feet) from his nest as compared to a maximum movement of 49 meters (160 feet) for all other animals studied (Martin 1971). Mountain beaver

walk with a wide, shuffling gait, “like a bear” (Fisler 1965). They can run backwards as quickly as forward, an obvious advantage for narrow tunnel living (Camp 1918, D. Steele pers. obs.). They can also climb trees (L. Ingles 1960), sometimes to a height of 4.6 meters (15 feet) (Herlocker 1950).

While not aquatic animals, mountain beaver do not avoid water. For the northern subspecies, surface water is known to be diverted down burrows (Herlocker 1950), and they wade through partially flooded tunnels going about business as usual (Scheffer 1929). They traverse puddles and streams and can swim (Scheffer 1929, E. Ingles 1960). When free water is available, mountain beaver bathe regularly while digging or foraging (Goslow 1964).

Thermoregulation

One explanation for the limited distribution of mountain beaver is their limited ability to thermoregulate (*i.e.*, regulate body temperature) (Johnson 1971, Kinney 1971). They seem to tolerate low temperature extremes better than high ones, with a lethal body temperature of about 42 degrees Centigrade (108 degrees Fahrenheit) (Johnson 1971). When exposed to high ambient temperatures, animals in captivity respond by either reducing their activity and changing their body conformation (sprawling out their body), or by attempting to escape (Kinney 1971). Mountain beaver lack such behavioral responses as panting or salivation to reduce heat stress (Johnson 1971) and do not sweat. An annual summer molt decreases insulation, letting them tolerate greater heat (Johnson 1971).

Burrows provide a highly stable microclimate (Kinney 1971). Tunnels, and especially the nest chamber, which is lower in elevation and insulated with nesting material, maintain a stable temperature gradient (Kinney 1971). Daily temperature variation never exceeds 4 degrees Centigrade (7 degrees Fahrenheit), and the mean annual range is from 2 to 14 degrees Centigrade (36 to 57 degrees Fahrenheit) (Johnson 1971). The burrow maintains a relative humidity of nearly 100 percent (Voth 1968).

The Point Arena area has a relatively mild climate due to the buffering effect of the ocean. Little range in temperature occurs either daily or annually, with

average temperatures between 7.0 to 16.2 degrees Centigrade (45 to 61 degrees Fahrenheit) (U.S. Weather Bureau 1963). Point Arena has one of the longest growing seasons in California, over 300 days annually (Steele 1989).

Osmoregulation (Water Balance)

The mountain beaver has a very simple kidney structure that lacks the anatomical features necessary to concentrate urine effectively (Pfeiffer *et al.* 1960, Schmidt-Nielson and Pfeiffer 1970). It has been suggested that *Aplodontia* might have been one of the first mammals to have a primitive renal mechanism for concentrating its urine (Dicker and Eggleton 1964). One consequence of this inability to concentrate urine is that mountain beaver require large quantities of water to replace that lost through excretion (Nungesser *et al.* 1960, Dolph *et al.* 1962, Nungesser and Pfeiffer 1965), a need that may be a major reason why mountain beaver are restricted to moist environments (Pfeiffer 1965). Mountain beaver consume about 33 percent of their body weight in water daily and excrete most of this in urine (Nungesser and Pfeiffer 1961). Animals in captivity are known to drink a great deal of free water (Pfeiffer 1953, Schmidt-Nielson and Pfeiffer 1970). If free water is withheld, animals in captivity (*A. r. pacifica*) have survived for periods of several months without apparent distress, obtaining water entirely from the succulent vegetation they consume (Fisler 1965, Johnson 1971).

The importance of free water for Point Arena mountain beaver is not known. Some populations seem to live a considerable distance from free water. At these locations, free water comes from ephemeral puddles that form during rainstorms. The marine climate around Point Arena includes significant amounts of moisture from fog. Condensation of fog may provide adequate free water.

Behavior

Mountain beaver can be aggressive animals, have been called “cantankerous” or “vicious” (Smurthwaite 1986), and are swift, strong biters (Maser *et al.* 1981). However, captive animals have been reported to become quite docile and even eat out of people’s hands (Davis 1941, Herlocker 1950), although they do not exhibit affection or friendliness (Herlocker 1950, Smurthwaite 1986).

Territorial behavior is strong in mountain beaver (Nolte *et al.* 1993). Pfeiffer (1953) reports that males will kill females or other males if they are placed together in the same cage. Battles are common when animals encounter one another (Herlocker 1950). Although nests are defended fiercely, it is thought that tunnels are used in common by animals in a burrow system (Scheffer 1929). The response to meeting in a tunnel is unknown. Animals may forage in the same home range and meet with no apparent territorial response (Martin 1971). The fact that they tend to live in close association suggests some level of tolerance, perhaps based on chemical cues.

Mountain beaver have two scent glands at the base of their tail (Racy 1922). These give the animals a strong body odor, and may be a primary means of recognizing their own kind (Scheffer 1929). A sweet, musky smell in the urine is distinctive (Kindschy and Larrison 1961), and becomes accentuated during the breeding season (Fisler 1965). Scent-marking behavior has been observed (Nolte *et al.* 1993).

Mountain beaver produce large amounts of a milky eye secretion, which can at times cause their eyes to close. This secretion may be an indication of stress in captive animals (D. Steele pers. obs.), or a defense against eye damage while excavating (Maser *et al.* 1981). It has also been suggested that the eye secretion may induce a tonic immobility to avoid attack or may function in chemical communication (Nolte *et al.* 1993).

Senses

As is true of many burrowing animals, mountain beaver have highly developed tactile senses and will respond quickly to the slightest disturbance of their guard hairs or whiskers (Camp 1918, Scheffer 1929). Their senses of smell and taste also seem to be well developed. They will frequently raise their noses to sniff the air (Camp 1918, Voth 1968), and feeding is reduced when food is exposed to predator odors (Epple *et al.* 1993) or other repellent material (Campbell and Evans 1989). Their eyesight is poor and animals will frequently bump into objects in their path (Fisler 1965). Night vision is better than day vision (Voth 1968).

Although mountain beaver show little response to sharp noises (Fisler 1965), little is actually known about their auditory acuity. The possibility that mountain beaver can detect low or even very low frequencies is under investigation (R. Heffner pers. comm.). *Aplodontia* also has a very large and unique cochlear nuclear complex in the brain, which may indicate the ability to detect subtle changes in air pressure, perhaps an adaptation to burrow living (Merzenich *et al.* 1973).

Several types of vocalizations have been attributed to mountain beaver, including grunts, growls, cough-like sounds, sharp, high pitched coughs (Fisler 1965), and a harsh chattering-grating sound produced by gnashing the teeth (Maser *et al.* 1981). Scheffer (1929) states that mountain beaver do not whistle, but Kindschy and Larrison (1961) reported a shrill, whistle-like squeal from their captive animal. Mountain beaver do not make booming noises, as erroneously believed by early observers (Scheffer 1929).

Demographics

No information is known on the demographics of the Point Arena mountain beaver. In general, mountain beaver have an unusually low reproductive rate for a rodent (Pfeiffer 1958). Females typically do not breed until their second year (Pfeiffer 1958), and the breeding season is short and well-defined (Lovejoy and Black 1979). Females are monestrous, that is, they produce only one litter a year, and all breeding females ovulate at about the same time (Pfeiffer 1958). The gestation period is 28 to 30 days (Scheffer 1929, Pfeiffer 1958). Litters consist of two, three, or rarely four (Scheffer 1929, Dalquest 1948) or five (Herlocker 1950, Maser *et al.* 1981) offspring.

Newborn *Aplodontia* are naked and blind at birth (Cramblet and Ridenhour 1956, Lovejoy *et al.* 1978). Growth is rapid, and within 2 weeks, newborns are completely covered with hair (Lovejoy and Black 1974). Lactation extends for about 2 months (Pfeiffer 1958, Lovejoy and Black 1974). Pregnant and lactating females have a dark patch of mammary hairs around the nipples, which may be a physiological relict lost by more advanced mammals (Pfeiffer 1955).

Juveniles have fine, gray fur, but within a year most have a coarse pelage and are difficult to distinguish from adults (Lovejoy and Black 1974). Pfeiffer (1958) identified four age classes, based on the degree of closure of the epiphyseal femoral suture and tooth wear. Voth (1968) identified eight classes based on weight. Lovejoy and Black (1979) worked with three age groups based on both weight and external characteristics and questioned the validity of weight classes. Mountain beaver are thought to live at least 5 to 6 years (Lovejoy and Black 1979).

Male and female *Aplodontia* are not easily distinguished by external characteristics (Scheffer 1929, D. Steele pers. obs.), except in the breeding season when it is easy to distinguish male and female genitalia when visible (Godin 1964). Females are on average slightly smaller (Lovejoy and Black 1974), but not enough to be a diagnostic difference. During the breeding season, the sexes of adults can be distinguished because the testes in males, which are normally abdominal, become semiscrotal (Pfeiffer 1956, Lovejoy *et al.* 1978). Pregnant and lactating females can be identified by the dark hair around the nipples (Pfeiffer 1955).

The sex ratio of juvenile *Aplodontia* is 1:1 (Lovejoy and Black 1979). However, trapping results of adult animals have indicated a skewed sex ratio of 3:1 favoring males (Hubbard 1922). Other trapping studies have also shown a preponderance of males, at levels of 63.6 percent (Voth 1968), and 61.9 percent (Lovejoy and Black 1979). This may be a true representation of the population and not an artifact of trapping (Lovejoy and Black 1974), but no explanation has been given for this phenomenon.

No data are available on reproduction of Point Arena mountain beaver. The breeding season is thought to be from about mid-December to early January, based on data collected by Pfeiffer (1958) on *Aplodontia rufa phaea*, the Point Reyes mountain beaver. Gestation would then be from about mid- to late-January, and animals born in late January might begin to forage for themselves by early April. Size of litters, survival of young, sex ratio and other demographic information are unknown for the Point Arena mountain beaver.

Juvenile dispersal is generally thought to be completed by early fall. Also, dispersal of juvenile *Aplodontia* is thought to be primarily through excavation within the burrow system (Blair 1953), although some overland migration is seen (Martin 1971). Of 11 subadult animals monitored through radiotelemetry, 9 remained near the initial site of capture while 1 moved as far as 564 meters (1,850 feet). There seems to be no real difference between the movement of males and females (Martin 1971).

Dispersing animals may make several attempts to establish a nest before finding a suitable situation (Lovejoy and Black 1979, Martin 1971). Once the animal establishes its nest site, the site is used for long periods of time (Martin 1971). Animals may move quickly into an unoccupied nest (Martin 1971, Nolte *et al.* 1993).

Mortality factors are not easily studied in underground species. Mountain beaver are known to be prey of bobcats (*Lynx rufus*), fishers (*Martes pennanti*), coyotes (*Canis latrans*), great horned owls (*Bubo virginianus*) (Ingles 1965), striped skunks (*Mephitis mephitis*), eagles (Accipitridae family), minks (*Mustela vison*), and other predators (Ingles 1965, Knick 1984). Little is known of other mortality factors such as disease.

Aplodontia are not considered valuable game or fur animals today (Ingles 1965) although, in the past, Native American Indians wore robes made of mountain beaver and valued their meat (Herlocker 1950). The Indian robes, called “she-wal-lal,” were the origin of the mountain beaver nickname, sewellel, which Lewis and Clark misunderstood to be the name of the animal (Godin 1964).

Fragility

There is no information on the Point Arena mountain beaver in captivity. At least one Point Arena mountain beaver was trapped and held for several days without any apparent harm, and several individuals have been live-trapped and released with similar results (D. Steele pers. obs.). Observations based on other subspecies provide conflicting reports on the species’ fragility. Camp (1918) stated that *Aplodontia* are not hardy and do not live long if injured in the least. Pfeiffer

(1953) noted that some animals recovered from injury and even from biopsies of parts of the reproductive system. Captured animals in the Pacific Northwest have a high trap mortality (Dodge and Campbell 1965, Lovejoy and Black 1979) and mountain beaver are known to die unexpectedly in captivity (Kindschy and Larrison 1961, D. Steele pers. obs.). Others report that mountain beaver are easy to maintain in captivity for long periods of time (Fisler 1965, Davis 1941).

The sensitivity of mountain beaver to disturbance is not well known. Although most burrow openings are in isolated areas or under dense vegetation or on steep slopes, a population of *Aplodontia rufa nigra* has coexisted since at least 1981 with campers in the Manchester Beach State Park campground (D. Steele pers. obs.). However, crushing of vegetation and burrows by campers at Manchester Beach State Park resulted in a decrease in active and new burrows near the campground (S. Flowers *in litt.* 1997, K. Fitts *in litt.* 1997). Scheffer (1929) reported that animals remained in their burrows despite clearing of vegetation, nearby blasting, burning of log and brush piles, and obstruction of burrow openings. Similar observations were made by Campbell *et al.* (1988) in studies in the State of Washington. Gyug (1997) noted that ground disturbance resulting from logging was inversely related to the presence of mountain beaver in southern British Columbia. The 1995 Mt. Vision fire at Point Reyes National Seashore may have destroyed 50 to 60 percent of the available Point Reyes mountain beaver habitat with very low survival in these populations (G. Fellers pers. comm. 1996).

Pest Control

The California subspecies of mountain beaver are generally found in low numbers in isolated areas. However, in other portions of its range, especially in Washington and Oregon, mountain beaver are thriving and considered pests because of damage inflicted on commercial Douglas-fir plantations (Martin 1971, Maser *et al.* 1981, Smurthwaite 1986). The Point Arena subspecies is not known to cause problems beyond some minor garden pilfering and burrows in unwanted places.

E. REASONS FOR LISTING AND THREATS TO SURVIVAL

The vulnerability of the Point Arena mountain beaver results from two basic facts: 1) this subspecies has few populations, all of which have an extremely limited distribution; and 2) the number of individuals in the populations are presumed low. Add to this its low reproductive rate, and any catastrophe, whether natural or human-caused, has a high potential to severely impact the subspecies. Urban development and related facilities, livestock grazing, human disturbance, riparian habitat destruction, transportation and utility corridors, and catastrophic natural events all pose some degree of direct or indirect threat to Point Arena mountain beaver at various locations. However, the extent to which each of these factors threaten Point Arena mountain beaver populations is largely unknown. Several of these factors may pose a greater threat to this subspecies, but no quantitative assessment of risk has been made.

Historically, the conversion of heavily forested areas to agriculture, including grazing, may have created suitable habitat for Point Arena mountain beavers in some areas (T. Wooster *in litt.* 1997). Conversely, livestock grazing may have substantially reduced the extent of historical coastal scrub habitat in the area (Steele 1986) offsetting any gains from forest conversions. Today, grazing is considered to be the most important factor limiting the expansion of extant Point Arena mountain beaver populations (T. Wooster *in litt.* 1997). Many populations are found near agricultural or ranch land and are impacted by livestock that step on *Aplodontia* burrows and destroy runways (D. Steele pers. obs., Steele 1986). Sheep and cattle grazing at the AT&T communications facility also may have impacted the mountain beaver population there.

Urban development and associated activities may directly or indirectly affect mountain beaver populations. At Irish Beach, the mountain beaver population at this site (Irish Gulch) may have been affected indirectly by trash dumping and an increase in predation by feral and nonferal house pets. Construction of private and county roads has also resulted in some habitat loss, such as along Hathaway Creek where a population was bisected by an access road to a residence (T. Wooster *in litt.* 1997). The latest revision to the Mendocino County Land Use Plan shows additional housing developments, creating a potential for additional

indirect and direct disturbance to the mountain beaver population in the Irish Gulch area.

Transportation and utility facilities may adversely affect mountain beaver in various ways. Recent fiber optics projects have drilled under Point Arena mountain beaver populations and caused noise, vibration, and some physical impacts to their habitat. The significance of these actions is not known and needs further monitoring. Habitat loss is likely as a result of construction and secondary impacts from use of the AT&T communications facility. It is not known how large this mountain beaver population was prior to construction of the communication facility, but the present population roughly estimated at about 20 animals, continues to be impacted by pedestrians and occasional project activities. Roadways may reduce or eliminate the ability of young Point Arena mountain beaver to disperse successfully from natal areas. Three observations of mountain beaver killed crossing Highway 1 have been made, one at Gasker Slough bridge (K. Joe pers. comm.), and two at Kinney Road (D. Steele pers. obs., K. Fitts pers. obs.). Populations at Lower Hathaway Creek, Alder Creek, Manchester Beach State Park, and Irish Beach have burrows near roadways (Steele 1986), and therefore, may be subjected to higher mortality rates than other populations. It is not known if these populations were present before road construction, but they have persisted since being discovered.

Human disturbance from recreational activities also may adversely affect mountain beaver populations. At Manchester Beach State Park, campers had wandered off the designated trails into mountain beaver habitat, thus trampling vegetation and crushing burrows. This impact resulted in a decrease in active and new burrows near the campground and on trails. Three campsites were closed to the public in 1995. Since closure, fresh burrows have been excavated (Fall 1995, 175 burrows; Fall 1996, 215 burrows) and increased activity in established burrows has been noted (S. Flowers *in litt.* 1997, K. Fitts *in litt.* 1997).

The Irish Beach-to-Manchester Alternative Coastal Trail has been proposed to provide non-vehicular beach access at Irish Beach, Alder Creek Beach Road, Kinney Road, and Stoneboro Road. This project includes construction of a parking area, an interpretive center, and access to the proposed trail at both Irish

Gulch and Alder Creek. Also, the town of Point Arena plans to develop a trail along Point Arena Creek. These projects could increase human disturbance to mountain beaver populations and could reduce habitat quality. No information exists on how the Point Arena mountain beaver would react to such human disturbance.

Unauthorized destruction of riparian habitat continues to occur on a regular basis within the range of the Point Arena mountain beaver (E. Ramos pers. comm.). In some cases, unauthorized activities have resulted in destruction of mountain beaver habitat or potential habitat from heavy equipment use, vegetation cutting, and/or vegetation burning (D. Steele pers. obs.). A study by Motobu (1978) on the effects of controlled slash burning on a population of Washington mountain beavers (*A. r. rufa*), revealed that fire substantially reduced the mountain beaver population within burn units. Also, predator activity increased substantially within the burn units after the fire.

Succession of shrubby open habitat preferred by the Point Arena mountain beaver to dense, closed canopy forest may threaten mountain beaver populations at several locations (T. Wooster *in litt.* 1997).

Pest control is an on-going threat to *A. r. nigra*. Past gopher control programs in western Mendocino County may have impacted Point Arena mountain beaver. Maintenance workers at the KOA campground near Manchester Beach State Park placed poison bait and traps out to kill mountain beaver they mistakenly thought to be gophers. Rodent trapping and baiting, often associated with residences and gardens, is still common along the Mendocino Coast (Steele 1986). Baits laced with strychnine or anticoagulants are the most widely used (Steele 1986). Other damaging chemicals, to which mountain beaver may be exposed, include copper sulfate, which is sometimes applied to wet spots and seeps to control sheep liver fluke (Steele 1986), and herbicides, which are regularly sprayed on vegetation near mountain beaver populations to maintain road edges and utility corridors. No information is available assessing the impacts of such activities on the Point Arena mountain beaver. Any mountain beaver that may have succumbed to chemical poisoning would likely have died unobserved within its burrow. The small, isolated populations of Point Arena mountain beaver are highly vulnerable

to extirpation from lethal chemicals.

Several alien plants occur in Point Arena mountain beaver habitat including gorse (*Ulex europaeus*), broom (*Cytisus* sp.), pampas grass (*Cortaderia selloana*), German ivy (*Senecio mikanioides*), ice plant (*Mesembryanthemum* sp.), and European beachgrass (*Ammophila arenaria*). In some areas these species are established and relatively widespread, and may reduce or improve the quality and quantity of Point Arena mountain beaver habitat. For example, German ivy is known to be a problem in some areas and spreading, but more survey work is needed to determine the extent of detrimental effects. No specific impacts to occupied habitat have been documented but are likely (D. Steele pers. comm.). German ivy favors shady and disturbed areas, and is renowned for invading riparian areas. Native to South Africa, it is generally found below 180 meters (600 feet) (K. Fuller pers. comm.).

Ice plant is slowly spreading in some older dune areas. Observations of some mountain beaver burrows at Manchester Beach State Park revealed partially eaten pieces of ice plants (Fitts 1996, D. Steele pers. obs.), which may provide the mountain beaver with a year-around food source that is high in water content. Ice plant also may be beneficial in that its root structure may stabilize sandy soil through which the mountain beaver burrows (Fitts 1996).

European beachgrass has displaced native vegetation at the AT&T population site and at Manchester Beach State Park. There are burrows at the edge of the habitat, but no signs of foraging (D. Steele pers. comm.). European beachgrass is found at several burrows in the Point Arena area. Many of the burrows are located underneath the plants, and runways are found under large clumps of dead beachgrass. The root system of beachgrass is an important soil stabilizer, and the canopy provides cover (Fitts 1996).

The importance of alien species, such as ice plant and European beachgrass, to the Point Arena mountain beaver is not fully known. Further studies should be undertaken to assess their significance, and careful consideration should be given to the effects of their management on the mountain beaver (Fitts 1996).

Little is known regarding diseases of mountain beaver or their potential to threaten mountain beaver populations. Animals in captivity have succumbed to infection and intestinal disease. Mountain beaver are known to harbor tapeworms and other parasites (Canaris and Bowers 1992).

Mountain beaver are preyed upon by most predators of small mammals including coyotes, skunks, owls, weasels, raptors, etc. Sign of predation by bobcat on Point Arena mountain beaver has been reported (T. Wooster pers. comm.) as well as raptor predation (D. Steele pers. obs.). Domestic and feral dogs are known to kill Point Arena mountain beaver, and cats are suspected predators of young mountain beaver. Domestic and feral animal predation would be expected to be greater for those mountain beaver populations located adjacent to urban and agricultural developments such as Irish Gulch, Alder Creek, and Point Arena. This is supported by the discovery of a Point Arena mountain beaver killed by a domestic dog (K. Joe pers. comm.). The impact of predation on small populations has the potential to become critical.

Because Point Arena mountain beaver have a clumped and fragmented distribution, they are more vulnerable to localized catastrophic events such as storms, fire, flooding, landslides, disease, or prolonged drought than species exhibiting a more widespread and continuous distribution. In the last 10 years, fires, flooding, mud slides, and beach erosion have destroyed Point Arena mountain beaver habitat at several locations (D. Steele pers. obs.). Natural disasters could easily eliminate all individuals in a population or further depress already low population numbers to a point where they could not recover. Fragmentation would prevent individuals from other populations from recolonizing unoccupied habitat.

Point Arena mountain beaver population numbers may be so low that the effects of inbreeding among closely-related individuals could result in an increase in deleterious genes in the population. Individuals possessing such deleterious genes are less likely to be capable of adapting to environmental changes, even relatively minor ones. Moreover, small populations are subject to the effects of genetic drift, the random decline in genetic variation that can occur in small populations. This too limits the flexibility of a population to respond to environmental changes.

The effects of genetic drift and inbreeding depression are genetically similar.

Habitat fragmentation is a major concern because it can increase the genetic isolation among populations of mountain beaver. Habitat fragmentation can reduce population size, thereby increasing the probability of genetic drift and inbreeding depression. This may result in less viable and adaptable populations of mountain beaver.

F. CONSERVATION MEASURES

The following are efforts to protect Point Arena mountain beaver:

EFFORTS CURRENTLY IN PLACE:

- Listing the Point Arena mountain beaver as a federally endangered species has given the subspecies a certain amount of protection.
- Timber Harvest Plans must determine the presence or absence of Point Arena mountain beaver and take steps to avoid disturbance, if present. Section C (Biological Resources) of Appendix-Technical Rule Addendum No. 2 in “California Forest Practice Rules, Title 14, California Code of Regulations” states that: “Biological assessment areas will vary with the species being evaluated and its habitat. Factors to consider in the evaluation of cumulative biological impacts include: 1. Any known rare, threatened, or endangered species or species of special concern . . . that may be directly or indirectly affected by project activities...”. Section 1034 describes the requirement of the contents of the proposed Timber Harvest Plan, including “information on the presence and protection of known habitat or individuals of any listed species which may be significantly impacted by the timber operation.”
- The California Department of Fish and Game’s California Natural Diversity Database lists known populations of the Point Arena mountain beaver and provides this information for planning purposes.

- The AT&T Corporation has placed funds in an escrow account to be dedicated for holding and disbursing monies as part of mitigation for the bentonite spill of 1992. It was apparently not possible to procure a satisfactory conservation easement in the Point Arena area, as was previously anticipated.
- A 5-year study to monitor Point Arena mountain beaver as part of mitigation for an MCI microwave tower has been completed (Northern and Fitts 1993-1996, 1998). In this study, burrows were monitored along transects on the impacted site as well as two control sites, and data on vegetation were collected. Construction of the MCI facility caused a decrease in the number and areal extent of active burrows, however, the project did not adversely affect the Point Arena mountain beaver, and there has been a gradual recovery since 1993 in active and total number of burrows per plot on the impact site (Northern and Fitts 1995, 1998).

EFFORTS CURRENTLY UNDERWAY:

- Due to the Federal listing, planning decisions must take possible threats to the mountain beaver into consideration.
- Recommendations have been made for the placement of ramps to cover fragile mountain beaver habitat within the Manchester Beach State Park camping area. However, lack of funds and a “low priority” ranking have impeded this important method of protection from taking place (S. Flowers *in litt.* 1997).
- The City of Point Arena has wording in its General Plan for mapping and protection of the Point Arena mountain beaver, however, the City has not yet accomplished its General Plan mandated tasks in this area (A. Levine *in litt.* 1997).
- The North Coast Regional Water Quality Control Board has completed a draft report entitled “Staff Report on the Proposal to Include a Water Quality Attainment Strategy (Total Maximum Daily Load) for the Garcia

River Watershed into Section 4, Nonpoint Source Measures, of the *Water Quality Control Plan for the North Coast Region*” (1997). This planning effort by the Regional Board provides an opportunity for the Regional Board, working with the Mendocino Resource Conservation District (*Garcia River Watershed Enhancement Plan*, Mendocino Resource Conservation District [1992]), to enhance habitat for the Point Arena mountain beaver during restoration efforts in the Garcia River Watershed area.

- The U.S. Environmental Protection Agency and California Department of Pesticide Regulation are in the process of developing an Endangered Species Protection Program to protect federally listed threatened and endangered species and their critical habitat from harm due to pesticide use. In the interim, the two agencies have produced a rodenticide bulletin entitled “Protecting Endangered Species, Interim Measures for Use of Rodenticides in Mendocino County” (U.S. Environmental Protection Agency and California Department of Pesticide Regulation 1998). This bulletin recommends methods of pesticide application to protect wildlife species, including the Point Arena mountain beaver.
- The “Manchester State Park General Plan” was prepared by the California Department of Parks and Recreation in December 1992 (California Department of Parks and Recreation 1992). The “Directive” for the Point Arena mountain beaver states: “Any potential habitat not yet investigated in the unit shall be surveyed for the presence of Point Arena mountain beaver, and for potential mountain beaver habitat. Perpetuation and protection of mountain beaver habitat shall be a high priority in management of both potential and occupied habitat areas. The department shall work with the Department of Fish and Game and the U.S. Fish and Wildlife Service in management of this sensitive species, including cooperating in the determination of critical habitat and in preparing the recovery plan. Potential habitat and occupied colonies should be mapped on unit base maps, and should not be available to the general public. If deemed necessary, occupied habitat areas may be closed to visitor use to avoid disturbance to shallow burrow systems” (California Department of Parks and Recreation 1992).

II. Recovery

A. OBJECTIVE AND CRITERIA

The objective of this recovery plan is to delist the Point Arena mountain beaver. Detailed information on many aspects of the biology, habitat requirements, and distribution of the Point Arena mountain beaver is lacking. The recovery criteria for downlisting and delisting, therefore, reflect the best biological knowledge and assumptions regarding the species. These reclassification criteria should be considered preliminary and may be revised when new data become available.

Downlisting criteria:

1. At least 16 populations are protected from human-caused disturbance in perpetuity. Each population shall contain at least 20 hectares (49 acres) of suitable habitat of which at least 10 hectares (25 acres) are occupied habitat.
2. These populations shall have a mean density of at least 4 Point Arena mountain beavers per hectare (1.6 per acre) of occupied habitat, unless new data show that a lower density is healthy and stable.
3. All 16 populations are stable (i.e., no more than a 25 percent change in estimated population size from highest to lowest value) or increasing for a period of at least 10 years (following attainment of criterion #1), as documented through establishment and implementation of a scientifically acceptable population monitoring program.
4. The amount of additional habitat needed for population interconnectivity, travel, and dispersal habitat (i.e. to prevent inbreeding and genetic drift) has been determined.
5. Sufficient information is available on the subspecies habitat requirements and life history to permit adaptive management, and any management

actions necessary to ensure the continued success of these populations (in criterion #1) have been fully implemented.

Delisting criteria:

1. Thirty populations are protected from disturbance in perpetuity. Each population shall contain at least 20 hectares (49 acres) of suitable habitat of which at least 10 hectares (25 acres) are occupied habitat.
2. These populations shall have a mean density of at least 4 Point Arena mountain beavers per hectare (1.6 per acre) of occupied habitat, unless new data show that a lower density is healthy and stable.
3. All 30 populations are stable (i.e., no more than a 25 percent change in estimated population size from highest to lowest value) or increasing for a period of at least 15 years (following attainment of criterion #1), as documented through establishment and implementation of a scientifically acceptable population monitoring program.
4. Additional habitat needed for population interconnectivity, travel , and dispersal habitat has been protected and is being managed appropriately.
5. Adaptive management prescriptions have been determined and implemented for all populations, including repatriated populations if deemed necessary.

The estimated date for downlisting to threatened status is 2015 and delisting is by 2025.

The goals and objectives stated here are subject to change as more information becomes available on the Point Arena mountain beaver through the work undertaken in this recovery effort, and as advances are made in the field of conservation biology and in our understanding of endangered species.

B. STEPDOWN NARRATIVE

1. Protect existing mountain beaver populations.

Twenty-six Point Arena mountain beaver populations have been found to date. Long-term habitat protection is vital for the protection of Point Arena mountain beaver populations. Most of the threats to the animal are a result of habitat destruction and degradation. All known populations must be protected in perpetuity from the threats identified in Section I.E. (with special consideration for unusual habitats).

1.1 Protect existing populations through land acquisitions, easements, conservation agreements, or other mechanisms.

The priorities for land protection should be based on size of mountain beaver populations, degree of threats to habitat, and willing landowners. It may be advantageous to look at areas that would benefit several other species of concern in addition to the Point Arena mountain beaver. Areas protected should include appropriate buffers to protect the population from outside disturbances. Suitable, but currently unoccupied, habitat may be a necessary reservoir for mountain beaver to ensure population structure and dynamics (Todd 1990). It is, therefore, necessary to protect not only habitat currently occupied by mountain beaver, but also unoccupied habitat to allow for population expansion. Habitat protection can be achieved through acquisition, easements, conservation agreements, or other mechanisms, including zoning ordinances.

1.2 Develop and implement management plans for Point Arena mountain beaver populations on public lands.

Management plans should be developed for all populations on public lands. Methods to minimize or eliminate identified threats

to mountain beavers at each population should be included in the management plan. Management plans should be adaptable to the results of research and monitoring. Each plan should include contingencies in the event that the mountain beaver population declines to low levels. Management measures that should be considered include fencing to keep out recreationists and grazing animals, elevated walkways or footpaths to divert foot traffic away from mountain beaver habitat, open culverts or other devices to provide safe passageways for mountain beavers under roadways, vegetation management such as exotic plant control, and control of domestic and feral animal predation.

1.3 Develop and implement management guidelines to protect existing populations of Point Arena mountain beaver on private lands.

Guidelines should be developed to include specific policies for managing existing populations of mountain beaver on private lands. These policies should address identified threats to the species such as predation by domestic and feral dogs and cats. Vegetation management and exotic plant control should also be addressed. The guidelines should cover pesticide use, domestic animals, protective measures, etc. A section on emergency response for contingencies such as fire and other natural and human-caused disasters should also be included. Implementation and enforcement should also be covered. These guidelines should be revised regularly as more information becomes available on the Point Arena mountain beaver.

These guidelines should be developed and implemented by agencies and individuals including the County of Mendocino, Caltrans, California Department of Forestry, California Coastal Commission, local fire departments, the timber industry, City of Point Arena, Manchester (Point Arena) Rancheria, and local citizens, with the assistance of the U.S. Fish and Wildlife Service and California Department of Fish and Game.

1.4 Enhance/restore habitat at existing populations, where appropriate.

Enhancement/restoration can increase the suitability and availability of habitat for Point Arena mountain beaver. Guidelines for enhancement and restoration of habitat should be determined using data gathered in Task 4.7. Enhanced or restored habitat should be monitored to assure that clearly identified standards of success are met. The results of monitoring studies should be used to identify adaptive management strategies to further enhancement and restoration goals and objectives.

1.4.1 Evaluate and identify protected sites for enhancement and restoration.

Priorities should include buffer habitat adjacent to existing populations and degraded mountain beaver habitat with a high degree of potential for success.

1.4.2 Develop and implement site-specific enhancement and restoration strategies.

A strategic plan should be developed for each enhancement/ restoration site outlining procedures, site treatments, plant species selections, costs, timeline, and success criteria. This plan should then be implemented at each site.

1.4.3 Develop and implement vegetation monitoring plans for enhanced/restored sites.

Restoration sites must be monitored for a period of time to be determined under Task 5.2. Monitoring techniques should be designed to contribute to our knowledge of the habitat requirements of Point Arena mountain beaver. Techniques should be selected from existing mitigation

guidance, expert input, and comparison with conditions at other representative population and reference sites. Sampling methodologies should be clearly defined. Goals and success criteria should be developed for, but not necessarily limited to, biological factors such as plant species composition, survivorship, plant height, plant vigor and health, percent vegetative cover, natural reproduction and recruitment, and any physical factors found to be representative of Point Arena mountain beaver habitat.

Contingency plans should be developed to guide remedial actions in the event success criteria are not met. Population trends of the mountain beaver, if present, should also be monitored at restoration sites (see Task 1.5).

1.5 Monitor existing Point Arena mountain beaver populations.

A better understanding of population numbers and distribution will give a fuller picture of population viability and threats to Point Arena mountain beaver. These numbers are necessary to assess the subspecies' status over time. Techniques for monitoring should be evaluated and developed (Task 4.3). All known populations should be monitored to determine population trends and habitat changes and identify threats to populations. To use available time and funding most effectively, this monitoring should be both qualitative and quantitative, with all populations being assessed qualitatively, and only selected populations monitored using more quantitative techniques.

1.5.1 Develop protocols for qualitative and quantitative monitoring.

Protocols for the collection and analysis of qualitative and quantitative monitoring data should be developed using

information from Task 4.3.

1.5.2 Conduct qualitative assessments of all known populations.

Each population should be monitored to determine its status. Parameters to be noted include presence/absence of burrows, activity (digging, clipping, debris, cobwebs, etc.), habitat modification, disturbance, or threats, and other factors using protocols developed under Task 1.5.1. Monitoring should be undertaken at the same time of year, preferably in the spring or summer.

1.5.3 Conduct quantitative assessments of representative populations.

Representative populations will be chosen to be monitored in greater detail, using protocols identified under Task 1.5.1 and techniques developed in Task 4.3.

2. Survey to locate new populations.

The historic range of the Point Arena mountain beaver should be surveyed to identify any new populations. Much of the suitable mountain beaver habitat, however, is on private land or in inaccessible areas. Therefore, gaining access to these areas is essential to accomplishing this task. New populations found beyond the current known range would be particularly significant discoveries.

2.1 Develop a survey protocol.

A presence-absence survey protocol should be developed to guide surveying efforts.

2.2 Identify suitable habitat for surveying.

The latest aerial mapping techniques should be used to identify vegetation types known to provide suitable habitat for Point Arena mountain beaver. Information gathered in Task 4.7 should assist in identification of suitable habitat. Areas for surveying should include class I and II streams to the east of the known range, as well as stream drainages and other suitable habitat to the north and south of the existing range. This mapping will help identify buffers needed in Task 1.1, corridors between existing populations (see Task 3), and/or other areas that may need special management consideration.

2.3 Obtain permission from landowners to survey for Point Arena mountain beaver.

Before conducting surveys, the landowner must grant permission.

2.4 Survey suitable habitat for additional populations.

Once permission to survey is obtained from landowners, surveys should be conducted in suitable habitat identified in Task 2.2. Also, the opportunity should be taken to collect Point Arena mountain beaver data during other activities, such as Timber Harvest Plan reviews, permitting, etc.

2.5 Update the California Natural Diversity Data Base (CNDDB).

To maintain a current and accurate database, all new population information should be sent to the CNDDB for updating. When making planning decisions, State and local agencies and private entities rely on data from the CNDDB to identify areas that may contain Point Arena mountain beaver. Agencies and individuals do not always send new population findings to the CNDDB, resulting in planning decisions based on outdated or insufficient

information on Point Arena mountain beaver.

2.6 Develop maps of the distribution of the Point Arena mountain beaver.

Maps of the distribution of Point Arena mountain beaver should be developed using a Geographic Information System (GIS). Each known population should be surveyed using Global Positioning System (GPS) equipment to determine the precise location and extent of burrow systems. These data could be combined with monitoring data to quantify population sizes, habitat, and land uses to accurately map the distribution of the subspecies. Mapping may also help define a population as it relates to groups of burrow systems. This term has been loosely applied to isolated burrows, some of which likely have only one or two animals. Some populations may actually be part of larger metapopulations. Using information gained through mapping, along with genetic analysis (Task 4.6), it should be possible to better define the population structure of Point Arena mountain beaver.

3. Establish corridors between populations, where feasible.

Corridors should be maintained or established, where feasible, to allow movement and genetic exchange among populations. As more information becomes available on the distribution and habitat requirements of Point Arena mountain beaver, it is expected that more corridors will be identified.

3.1 Identify corridors needing protection.

Using information gathered in Tasks 2.2, 2.4, and 4.7, identify existing habitat that could provide corridors between mountain beaver populations.

3.2. Protect identified corridors.

Corridors identified in Task 3.1 should be protected through purchase, conservation easements or other appropriate mechanism. Corridors should be monitored for mountain beaver activity (Task 1.5.2), and managed appropriately (Task 1.2 or 1.3). Habitat within corridors should be enhanced/restored if deemed necessary (Task 1.4.1).

4. Conduct research on Point Arena mountain beaver.

More research is needed to determine what historic and current land use activities favor or impact Point Arena mountain beaver populations. Also, little information exists on the biology or ecology of the Point Arena mountain beaver. Even anecdotal observations are scarce. Most of our knowledge and assumptions are based on studies of other, more abundant, subspecies of mountain beaver. To make informed management decisions (i.e., applying adaptive management, which means conducting essential research, analyzing the results, and revising management accordingly), it is imperative to learn more about the Point Arena mountain beaver. Researchers who have been studying mountain beaver in Washington State and British Columbia have expressed interest in sharing information and may be able to provide helpful insights and techniques for use with the Point Arena subspecies.

4.1 Establish a library of literature on mountain beaver.

A comprehensive library of mountain beaver and related literature should be gathered and made available to researchers. This will save time and facilitate research because some of the literature is difficult to find. A literature search should be undertaken annually to keep the library current.

4.2 Design studies to gather biological/ecological data on Point Arena mountain beaver.

When techniques are developed, design a study or series of studies to collect data on parameters. Some of the basic parameters that need to be determined include: density, dispersal, travel corridors, population interconnectivity, age structure, litter size, longevity, and sex ratio.

4.3 Develop safe and accurate monitoring techniques.

Because mountain beaver spend most of their time underground, it is difficult to gather certain data without capturing animals. Indirect study methods should be used whenever feasible. Much of the research on mountain beaver has been accomplished through sacrificing animals. New techniques will need to be developed for handling animals with minimum disturbance and risk. A review of the literature to find successful surveying techniques used with similar animals would supplement this effort. All techniques must be perfected using other subspecies of mountain beaver before being attempted on Point Arena mountain beaver. The Point Reyes mountain beaver is most similar to the Point Arena mountain beaver and, therefore, would be the subspecies of choice for this work. The October 1995 fire at Point Reyes National Seashore resulted in monitoring of the surviving Point Reyes mountain beaver population. Monitoring there involves transect surveys of burrows to determine the beaver's survival and distribution within the burn area, and "automated" monitoring of burrows to determine short-term survival, reproductive success, and habitat suitability (BAER Team 1995). Many of these techniques could be used for the Point Arena mountain beaver.

Monitoring of the Point Arena mountain beaver was also done for the MCI Telecommunications Corporation. Method descriptions

can be found in Northen and Fitts (1993-1996, 1998). These methods may be suitable for use in future Point Arena mountain beaver monitoring activities.

4.3.1 Develop indirect monitoring techniques.

Indirect techniques, including cameras, smoke plates, microphones, activity counters, trip wires, hair traps and others, are preferable since they involve the least disturbance to the animals. These techniques need to be evaluated to determine which are most effective.

4.3.2 Develop safe live-trapping/handling techniques.

Mountain beaver are known to suffer from high trap mortality, at least in the Pacific Northwest (Dodge and Campbell 1965). Methods to minimize danger to the animal (and to the handler) must be perfected using other subspecies, prior to conducting any extensive live-trapping of the Point Arena mountain beaver.

4.3.3 Develop and implement safe radiotelemetry techniques.

Certain types of information, such as movement and dispersal activity, and home range, can only be gathered by following individuals through time. Radiotelemetry is an effective way of doing this. This technique should be adapted to Point Arena mountain beaver, again being perfected on a more abundant subspecies.

4.4 Study effects of scent on population establishment and dispersal.

Pheromone analysis may help determine whether chemical cues are causing Point Arena mountain beaver to cluster and occupy some

habitat and not to occupy other seemingly appropriate habitat.

4.5 Study effects of disturbance.

The Point Arena mountain beaver's sensitivity to disturbance is largely unknown. There have been several recent questions about disturbances of various kinds and the appropriate buffer zones needed to protect animals. More work needs to be done in these areas. Disturbance needs to be evaluated, including the effects of electromagnetic fields, noise, vibration, toxins, microwaves, and habitat modification, including fire, timber harvesting, and invasion of exotic plants such as German ivy, ice plant, and European beach grass. The ability of buffers to minimize disturbances should be evaluated. Results of this task should be used to update the comprehensive guidelines prepared in Task 1.3.

4.6 Conduct genetic analysis.

It is generally accepted that Point Arena mountain beaver has been geographically isolated from other subspecies for a long time, but the length and degree of genetic isolation are unknown. Insights could be provided through genetic analysis and comparison with other subspecies. It may be that full species status is more appropriate, as originally believed by Taylor (1914). This task is not considered to be of sufficient priority to warrant sacrificing animals. Material appropriate for genetic analysis should be salvaged, as appropriate, from animals that have died due to other causes, according to the necropsy/salvage protocol developed in Task 4.10. Also, hair, tissue, and blood samples could be collected from live animals.

4.7 Determine habitat requirements for Point Arena mountain beaver.

There is little quantitative information on the habitat requirements

of Point Arena mountain beaver. Populations have been found in a variety of habitat types, but basic limiting factors are not known. This information is necessary for management purposes and possible habitat restoration work.

Data should be collected on the following habitat parameters: vegetation associations (including exotic plants) and cover values, soil characteristics, slope/aspect, microclimate, hydrology, etc. Studies should be done on the spectrum of mountain beaver habitats. Historic aerial photos and mapping can be used to compare previous vegetation and land uses with current habitat use.

The duration and methodologies of this research should be determined under Task 4.2. It may be best to collect data over a longer period of time if unusual conditions such as drought occur.

4.8 Study the relationship of Point Arena mountain beaver to successional habitat.

The importance of successional habitat to Point Arena mountain beavers needs to be investigated at several sites where mountain beaver populations are found near recent timber harvesting activities.

4.9 Study food habits.

While it is known that Point Arena mountain beaver utilize many, if not most, of the plant species in their vicinity, there is little information on which plants are most important in their diet. A fecal analysis study could help to determine important food plants. Fecal material should be gathered over time, because food preferences may change throughout the year. Stomach contents from fresh carcasses can also be analyzed, according to the

protocol developed in Task 4.10.

4.10 Develop protocol for necropsies on any acquired carcass.

A protocol must be developed for treating animals found dead, to maximize the information available on the Point Arena mountain beaver. This protocol should include procedures for handling dead animals, salvaging and storing parts for further study, identifying the responsible party, data collection and analysis, necropsy procedures, museum or other repository consignment, and reporting of results.

4.11 Conduct a population viability analysis (PVA).

Conduct a PVA assessment using information gathered from Task 4.2. The PVA results should be used to assess the adequacy of the criteria for downlisting, delisting, and population stability, if possible.

4.12 Develop indices to track the active number of Point Arena mountain beaver burrows.

Indices should be developed to keep track of all active Point Arena mountain beaver burrows.

5. **Restore the Point Arena mountain beaver to suitable habitat.**

Restoration of Point Arena mountain beavers to suitable habitat may be a necessary tool for recovery if additional populations are not found to meet recovery criteria. The feasibility and necessity of relocating animals, however, should be evaluated after basic information is gathered about Point Arena mountain beaver and its habitat requirements.

5.1 Determine feasibility and necessity of relocation.

The feasibility and necessity of relocation should be assessed based on all available information.

5.2 Develop relocation protocols and conduct relocations, if feasible and necessary.

If relocation is deemed appropriate and necessary, a plan should be developed that identifies suitable habitat for relocation activities, appropriate animals to be relocated (*e.g.*, dispersing juveniles), and practical/technical aspects of the relocation project. Relocations would likely be conducted over several years. Relocated populations should be protected (Task 1.1); management plans should be developed and implemented, that include a contingency plan in the event that success criteria are not met (Task 1.2); and populations should be monitored (Task 1.5).

6. Conduct outreach.

To enlist the long-term support of landowners with Point Arena mountain beaver populations, the U.S. Fish and Wildlife Service, with assistance from the California Department of Fish and Game, should work one-on-one with each landowner to develop a program to protect the beaver and its habitat.

6.1 Develop and implement an outreach plan.

Outreach is an essential component of implementing this plan. A plan should be developed to provide factual information about the Point Arena mountain beaver and the recovery process to interested and effected landowners. For private lands with reported populations of the Point Arena mountain beaver, landowners should be apprised of the significance of the populations on their

lands and should be provided with information about available conservation mechanisms, such as conservation easements and incentive programs. For private lands with suitable habitat for Point Arena mountain beaver, permission should be sought from cooperative landowners to conduct on-site surveys (Task 2.4). If surveys identify populations, landowners should be apprised of their significance and offered incentives to continue current land uses that support mountain beaver habitat.

6.1.1 Develop and implement economic or other incentives for conservation and recovery of the Point Arena mountain beaver.

Economic and other incentive programs (*e.g.*, relief from taxes, tax credits, tax deductible habitat management expenses, Williamson Act, Conservation Reserve Program, Partners for Wildlife, etc.) may be important to gaining the support and assistance of private landowners in conserving and recovering the Point Arena mountain beaver. Such programs, if appropriate, should be developed for the planning area. Incentive programs could play an important role in protection of habitat on private property.

6.1.2 Produce and disseminate outreach materials.

A comprehensive outreach program could include the following materials:

- A booklet for adults that presents information on the biological importance of the Point Arena mountain beaver.
- A separate brochure to inform landowners of resources

available to them and steps they can take to protect mountain beaver on their land.

- An activity/educational book for children, geared for ages 6 to 12. This booklet could be disseminated through schools, at Manchester Beach State Park, through agency offices, etc.
- Other interpretive materials, such as models, are an important part of any outreach effort. The possibility of a permanent display should be explored.
- Periodic press releases on the recovery effort for dissemination to the media.
- Selected materials from this effort should be made available on the Internet and possibly in an electronic form, such as a compact disc, which can be used for educational purposes.

C. LITERATURE CITED

- Allen, L. 1969. Preferential food habits of *Aplodontia rufa*. Masters Thesis, Central Washington State College, Ellensburg, WA.
- BAER Team, North Zone. 1995. Mount Vision fire incident, burned area emergency rehabilitation (BAER) plan. Prepared for the U.S. Department of Interior, U.S. Park Service, Point Reyes National Seashore; California State Parks, Tomales Bay State Park; Marin County, Department of Public Works; Natural Resources Conservation Service, Petaluma District.
- Beier, P. 1989. Use of habitat by mountain beaver in the Sierra Nevada. *Journal of Wildlife Management* 53(3):649–654.
- Cafferata, S.L. 1992. Chapter 11, Mountain Beaver. *In* Silvicultural approaches to animal damage management in Pacific Northwest Forests. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR. General Tech Report PNW-GTR-287.
- Camp, C. 1918. Excavations of burrows of the rodent *Aplodontia* with observations on the habits of the animal. *University of California Publication in Zoology* 17(18):517–535.
- Campbell, D. and J. Evans. 1989. Aversive conditioning with thiram to reduce mountain beaver damage to Douglas-fir seedlings. *Northwest Science* 63(2): 70.
- Campbell, D., J. Ocheltree and M. Carey. 1988. Adaptation of mountain beavers (*Aplodontia rufa*) to removal of underground nests. *Northwest Science* 62(2):75.
- Canaris, A. and D. Bowers. 1992. Metazoan parasites of the mountain beaver, *Aplodontia rufa* (Rodentia: Aplodontidae), from Washington and Oregon, with a checklist of parasites. *Journal of Parasitology* 78(5):904–906.

- Carey, M., D. Campbell, and C. Campbell. 1989. Physical structure, flora and fauna of mountain beaver nests. *Northwest Science* 63(2):70.
- California Department of Parks and Recreation. 1992. Manchester Beach State Park, General Plan. Mendocino, California.
- Cramblet, H. and R. Ridenhour. 1956. Parturition in *Aplodontia*. *Journal of Mammalogy* 37(1):87–90.
- Crouch, G. 1968. Clipping of woody plants by mountain beaver. *Journal of Mammalogy* 49(1):151–152.
- Dalquest, W. and V. Scheffer. 1945. The systematic status of the races of the mountain beaver (*Aplodontia rufa*) in Washington. *Murrelet* 26(3):34–37.
- Davis, J. 1941. Notes on a captive mountain beaver. *Murrelet* 22(3):60–61.
- Dicker, S. and M. Eggleton. 1964. Renal function in the primitive mammal *Aplodontia rufa* with some observations on squirrels. *Journal of Physiology* 170:186–194.
- Dodge, W. and D. Campbell. 1965. Two techniques to reduce capture mortality. *Journal of Mammalogy* 46(4):707.
- Dolph, C., H. Braun, and E. Pfeiffer. 1962. The effect of vasopressin upon urine concentration in *Aplodontia rufa* and the rabbit. *Physio. Zool.* 35:263–269.
- Epple, G., J. Mason, D. Nolte, and D. Campbell. 1993. Effects of predator odors on feeding in the mountain beaver (*Aplodontia rufa*). *Journal of Mammalogy* 74(3):715–722.
- Feldhamer, G. and J. Rochelle. 1982. Mountain beaver-*Aplodontia rufa*. Pages 167–175 *In* *Wild Mammals of North America* (J.A. Chapman and G.A. Feldhamer eds.). John Hopkins University Press, Baltimore, MD. 1147 pp.

- Finley, Jr., R. 1941. Geographic variation in the rodent *Aplodontia rufa*. Murrelet 22(3):45–51.
- Fisler, G. 1965. A captive mountain beaver. Journal of Mammalogy 46(4):707–709.
- Fitts, K. 1996. Observations on use of two non-native plants by the Point Arena mountain beaver. California Fish and Game 82(1):59-60.
- Franklin, I. 1980. Evolutionary change in small populations. Pages 153–149 In M.E. Soulé and B.A. Wilcox, eds. Conservation biology, an evolutionary-ecological perspective. Sinauer Assoc., Sunderland, Mass.
- Godin, A. 1964. A review of the literature on the mountain beaver. U.S. Fish and Wildlife Service Special Scientific Report, Wildlife #78.
- Goslow, G. 1964. The mountain beaver, *Aplodontia rufa*. Unpublished MA Thesis. Humboldt State College, Arcata, CA.
- Gyug, L.W. 1997. 1997 Forest development plan, red- and blue-listed species inventory for: mountain beaver, Cascade mantled ground squirrel, sagebrush northern bog lemming, and tailed frog. Prepared for B.C. Ministry of Environment.
- Hacker, A. and B. Coblenz. 1993. Habitat selection by mountain beavers recolonizing Oregon coast range clearcuts. Journal of Wildlife Management 57(4):847–853.
- Hall, E. 1981. The mammals of North America. Volume 1, second edition. Wiley and Sons, New York NY.
- Hall, E. and K. Kelson. 1959. The mammals of North America. Ronald Press Co, New York. Vol. 1, p. 290–292.
- Herlocker, E. 1950. Mountain beaver-biological curiosity. Audubon Magazine

387–390.

- Hooven, E.F. 1973. Effects of vegetational changes on small forest mammals. Pages 75-97 *In* Hermann, R.K., Lavender, D.P., eds. Even-age management: Proceedings of a symposium, August 1, 1972, Corvallis, OR, School of Forestry, Oregon State University. pp. 75-97.
- Hubbard, C. 1922. Some data upon the rodent *Aplodontia*. Murrelet 3(1):14–18.
- Ingles, E. 1960. Underground dwellers in the forest. Audubon Magazine 210–213.
- Ingles, L. 1959. A quantitative study of mountain beaver activity. American Midland Naturalist 61(2):419–423.
- Ingles, L. 1960. Tree climbing by mountain beavers. Journal of Mammalogy 41(1):120–121.
- Ingles, L. 1961. Reingestion in the mountain beaver. Journal of Mammalogy 42(3):411–412.
- Ingles, L. 1965. Mammals of the Pacific States. Stanford University Press. Palo Alto, CA.
- Johnson, S. 1971. Thermoregulation, microclimate and distribution of *Aplodontia rufa*. Unpublished PhD Thesis, Oregon State University, Corvallis, OR.
- Kindschy Jr, R. and E. Larrison. 1961. Observations on a captive mountain beaver. Murrelet 42(1):1–3.
- Kinney, J. 1971. Environmental physiology of a primitive rodent (*Aplodontia rufa*). Unpublished PhD Thesis, University of Oregon, Eugene.
- Knick, S. Food habits of bobcats (*Lynx rufus*) in Washington. 1984. U.S. Fish

and Wildlife Service Report W-84-R-7 II-S.

- Lacy, T. 1991. Comparison of the digestible and metabolizable energy of plants consumed by mountain beaver (*Aplodontia rufa*). Unpublished MA Thesis. Humboldt State University, Arcata, CA.
- Lovejoy, B. and H. Black. 1974. Growth and weight of the mountain beaver, *Aplodontia rufa pacifica*. Journal of Mammalogy 55(2):364–369.
- Lovejoy, B. and H. Black. 1979. Population analysis of the mountain beaver, *Aplodontia rufa pacifica* in Western Oregon. Northwest Science 53(2):82–89.
- Lovejoy, B., H. Black, and E. Hooven. 1978. Reproduction, growth, and development of the mountain beaver (*Aplodontia rufa pacifica*). Northwest Science 52(4):323–328.
- Martin, P. 1971. Movements and activities of the mountain beaver (*Aplodontia rufa*). Journal of Mammalogy 52(4):717–723.
- Maser, C., B. Mate, J. Franklin and C. Oyrness. 1981. Natural history of Oregon Coast mammals. U.S. Forest Service General Technical Report PNW-133. 496 pp.
- Mendocino County Resource Conservation District. 1992. Garcia River watershed enhancement plan. Prepared for the California State Coastal Conservancy, Ukiah, CA.
- Merzenich, M., L. Kitzes, and L. Aitkin. 1973. Anatomical and physiological evidence for auditory specialization in the mountain beaver (*Aplodontia rufa*). Brain Research 58:331–344.
- Morris, K., C. Champ, G. Morris, and J. Ha. 1995. The influence of proximity to humans on population density and home range size of mountain beaver (*Aplodontia rufa*). Annual Conference of the Society for Northwestern Vertebrate Biology.

- Motobu, D. 1978. Effects of controlled slash burning on the mountain beaver (*A. r. rufa*). Northwest Science, Vol. 52, No. 2:92-99.
- Neal, F. and J. Borrecco. 1981. Distribution and relationship of mountain beaver to openings in sapling stands. Northwest Science 55(2):79-82.
- Nolte, D., G. Epple, D. Campbell, and J. Mason. 1993. Response of mountain beaver (*Aplodontia rufa*) to conspecifics in their burrow system. Northwest Science 67(4):251-255.
- North Coast Regional Water Quality Control Board. 1997. Water quality control plan for the north coast region. Santa Rosa, California.
- Northern, P.T and K.M. Fitts. 1993. Monitoring of the Point Arena mountain beaver for MCI Telecommunications Corporation. Year One Report.
- _____. 1994. Monitoring of the Point Arena mountain beaver for MCI Telecommunications Corporation. Year Two Report.
- _____. 1995. Monitoring of the Point Arena mountain beaver for MCI Telecommunications Corporation. Year Three Report.
- _____. 1996. Monitoring of the Point Arena mountain beaver for MCI Telecommunications Corporation. Year Four Report.
- _____. 1998. Monitoring of the Point Arena mountain beaver for MCI Telecommunications Corporation. Year Five Report.
- Nungesser, W. and E. Pfeiffer. 1965. Water balance and maximum concentrating capacity in the primitive rodent, *Aplodontia rufa*. Comparative Biochemical Physiology 14:289-297.
- Pfeiffer, E. 1953. Animals trapped in mountain beaver (*Aplodontia rufa*) runways, and the mountain beaver in captivity. Journal of Mammalogy 34(3):396.

- Pfeiffer, E. 1955. Hormonally induced mammary hairs of a primitive rodent, *Aplodontia rufa*. *Anatomical Record* 122(2): 241–256.
- Pfeiffer, E. 1958. The reproductive cycle of the female mountain beaver. *Journal of Mammalogy* 39(2):223–235.
- Pfeiffer, E. 1956. The male reproductive tract of a primitive rodent, *Aplodontia rufa*. *Anatomical Record* 122:629–635.
- Pfeiffer, E., W. Nungesser, D. Iverson, and J. Wallerius. 1960. The renal anatomy of the primitive rodent, *Aplodontia rufa*, and a consideration of its functional significance. *Anatomical Record* 137(3):227–235.
- Racey, K. 1922. The mountain beaver (*Aplodontia rufa*). *Canadian Field Naturalist* 36:30–32.
- Scheffer, T. 1929. Mountain beavers in the Pacific Northwest: their habits, economic status and control. U.S. Department of Agriculture Farmers Bulletin #1598.
- Scheffer, T. 1945. Burrow associations of small mammals. *Murrelet*. 26(2):24–26.
- Scheffer, V. 1969. Superflea meets mountain beaver. *Natural History* 78(5): 54–55.
- Schmidt-Nielson, B., and E. Pfeiffer. 1970. Urea and urinary concentrating ability of the mountain beaver, *Aplodontia rufa*. *American Journal of Physiology* 218(5):1370–1375.
- Schmidt-Nielsen, K. 1975. *Animal Physiology: Adaptation and Environment*. Cambridge University Press, New York. 699 pp.
- Shotwell, J. 1958. Aplodontid and Mylagaulid rodents. *Evolution* 12:465–484.

- Simpson, G. 1945. Classification of mammals. Bulletin of the American Museum of Natural History 85:200-202.
- Smurthwaite, D. 1986. Mountain beaver-the rodent that gets no respect. American Forests 46-50.
- Steele D. 1986. The mountain beaver (*Aplodontia rufa*) in California. Unpublished MS Thesis, University of California, Davis.
- Steele, D.T. 1986. A review of the population status of the Point Arena mountain beaver. Final Report for U.S. Department of the Interior, Fish and Wildlife Service, Endangered Species Office. Sacramento, California.
- Steele D. 1989. An ecological survey of endemic mountain beavers (*Aplodontia rufa*) in California, 1979-1983. State of California, Department of Fish and Game, Wildlife Management Division, Administrative Report #89-1.
- Taylor, W. 1914. A previously undescribed *Aplodontia* from the middle north coast of California. University of California Publications in Zoology 12:297-300.
- Taylor, W. 1918. Revision of the rodent genus *Aplodontia*. University of California Publication in Zoology 12(16):497-501.
- Todd, P. 1990. The distribution, abundance, and habitat requirements of the Sierra mountain beaver in Yosemite National Park. Unpublished MA Thesis, University of Montana, Missoula.
- U.S. Environmental Protection Agency and California Department of Pesticide Regulation. 1998. Protecting endangered species, interim measures for use of rodenticides in Mendocino County. Pesticides and toxic substances bulletin (H-7506C).
- U.S. Fish and Wildlife Service. 1991. Endangered and threatened wildlife and plants; Point Arena mountain beaver (*Aplodontia rufa nigra*) determined to be

endangered. 56(239): 64716-64722.

U.S. Weather Bureau. 1963. The Climate of Mendocino County. Univ. Calif. Extension Service Publication.

Voth, E. 1968. Food habits of the Pacific mountain beaver, *Aplodontia rufa pacifica*. Unpublished PhD Thesis, Oregon State University, Corvallis.

Whitaker Jr., J., C. Maser, W. Wallace. 1979. Parasitic mites of the mountain beaver (*Aplodontia rufa*) from Oregon. Northwest Science 53(4):264–267.

Williams, D. 1986. Mammalian species of special concern in California. Department of Fish and Game Wildlife Management Division Administrative Report 86-1.

Wright, J. 1969. Mountain beaver (*Aplodontia rufa*) behavior: extreme southern limits. Unpublished Masters Thesis, California State University, Chico.

D. PERSONAL COMMUNICATIONS

Fellers, G. 1996. Biological Resources Division, U.S. Geological Survey, Point Reyes National Seashore. Point Reyes, California.

Fitts, K. 1994. Wildlife Biologist. Santa Rosa, California.

Fuller, K. 1996. Botanist, U.S. Fish and Wildlife Service. Sacramento, California.

Heffner, R., PhD. 1994. University of Toledo, Department of Psychology. Toledo, Ohio.

Joe, K. 1989. Park Ranger, California Department of Parks and Recreation, Manchester Beach State Park. Mendocino, California.

- Mohr, A. 1996. Alan Mohr and Associates, Inc. Point Arena, California.
- Ramos, E. 1994. California Department of Fish and Game. Yountville, California.
- Steele, D. 1992, 1994, 1998. Ecologist - Mountain Beaver Research. Stockton, California.
- Wooster, T. 1992, 1997. California Department of Fish and Game. Yountville, California.

E. *IN LITT.* REFERENCES

- Flowers, S. 1997. Letter to Wayne S. White, U.S. Fish and Wildlife Service, Sacramento, CA, commenting on Draft Point Arena Mountain Beaver Recovery Plan.
- Levine, A. 1997. Letter to Wayne S. White, U.S. Fish and Wildlife Service, Sacramento, CA, commenting on Draft Point Arena Mountain Beaver Recovery Plan.
- Valentine, B. 1997. Letter to Wayne S. White, U.S. Fish and Wildlife Service, Sacramento, CA, commenting on Draft Point Arena Mountain Beaver Recovery Plan.
- Wooster, T. 1997. Letter to Wayne S. White, U.S. Fish and Wildlife Service, Sacramento, CA, commenting on Draft Point Arena Mountain Beaver Recovery Plan.

III. Implementation Schedule

The Implementation Schedule that follows outlines actions and estimated costs for the recovery program of *Aplodontia rufa nigra*. It is a guide for meeting the objectives discussed in Part II of this Plan. This schedule indicates task priorities, task numbers, task descriptions, duration of tasks, the responsible agencies, and estimated costs. These actions, when accomplished, should bring about the recovery of the species and protect its habitat. Cost estimates provided here are intended as gross estimates for general planning purposes. More detailed budget analyses will be necessary by the responsible agencies.

Definition of Priorities:

Priority 1: An action that *must* be taken to prevent extinction or to prevent the species from declining irreversibly in the *foreseeable* future.

Priority 2: An action that must be taken to prevent a significant decline in species population/habitat quality, or some other significant negative impact short of extinction.

Priority 3: All other actions necessary to meet the recovery objectives.

Task Duration:

Continuous: A task that will be implemented on a routine basis once begun.

Unknown: Either task duration or associated costs are not known at this time.

Acronyms and Abbreviations:

CDF	-	California Department of Forestry and Fire Protection
CDFG	-	California Department of Fish and Game
CDPR	-	California Department of Parks and Recreation
CNDDDB	-	California Natural Diversity Database
COUN	-	County of Mendocino
FWS	-	U.S. Fish and Wildlife Service
TBD	-	To Be Determined

Implementation Schedule for the Point Arena Mountain Beaver

Priority	Task #	Task Description	Duration (Yrs.)	Responsible Party	Total Cost	Costs in \$1,000					Comments
						FY1 ¹	FY2	FY3	FY4	FY5	
1	1.1	Protect existing populations	5	FWS, CDFG, CDPR	500.0		100.0	100.0	100.0	100.0	
1	1.2	Develop and implement management plans	continuous	FWS, CDFG, CDPR	50.0	3.0	3.0	3.0	3.0	3.0	
2	1.3	Develop and implement management guidelines	continuous	FWS, CDFG, CDPR, COUN, CDF, others	50.0	3.0	3.0	3.0	3.0	3.0	
2	1.4.1	Identify habitat for restoration	2	FWS, CDFG	5.0		2.5	2.5			
2	1.4.2	Develop and implement site-specific restoration strategies	1	FWS, CDFG	TBD				TBD		
2	1.4.3	Monitor restoration	5	FWS	20.0					4.0	
2	1.5.1	Develop monitoring protocol	1	FWS, CDFG	3.0	3.0					
2	1.5.2	Conduct qualitative monitoring of populations	continuous	FWS, CDFG	25.0	2.5	2.5	2.5	2.5	2.5	
2	1.5.3	Conduct quantitative monitoring of populations	5	FWS, CDFG	10.0		2.0	2.0	2.0	2.0	
2	2.1	Develop a survey protocol	1	FWS, CDFG	5.0	5.0					
2	2.2	Identify suitable habitat for surveying	1	FWS, CDFG	5.0	5.0					

Implementation Schedule for the Point Arena Mountain Beaver

Priority	Task #	Task Description	Duration (Yrs)	Responsible Party	Total Cost	Costs in \$1,000					Comments
						FY1 ¹	FY2	FY3	FY4	FY5	
2	2.3	Obtain landowner's permission to survey	1	FWS, CDFG	2.0	2.0					
2	2.4	Survey for additional populations	3	FWS, CDFG, CDF	15.0		5.0	5.0	5.0		
2	3.1	Identify corridors to protect	5	FWS, CDFG	0.0						
2	3.2	Protect identified corridors	unknown	FWS	TBD						
2	4.2	Design studies to gather biological/ ecological data	2	FWS, CDFG	TBD						
2	4.3.1	Develop indirect monitoring techniques	4	FWS, CDFG	50.0		20.0	10.0	10.0	10.0	
2	4.3.2	Develop safe live-trapping/handling techniques	2	FWS	20.0		10.0	10.0			
2	4.3.3	Develop radiotelemetry studies	4	FWS	50.0			20.0	10.0	10.0	
2	4.4	Study effects of scent	2	FWS	TBD						
2	4.5	Study effects of disturbance	5	FWS	60.0		20.0	10.0	10.0	10.0	
2	4.7	Determine habitat requirements	5	FWS, CDFG	60.0		20.0	10.0	10.0	10.0	

Implementation Schedule for the Point Arena Mountain Beaver

Priority	Task #	Task Description	Duration (Yrs)	Responsible Party	Total Cost	Costs in \$1,000					Comments
						FY1 ¹	FY2	FY3	FY4	FY5	
2	4.9	Study food habits	2	FWS	20.0						
3	2.5	Update CNDDB	continuous	CDFG	0.0						
3	2.6	Develop GIS map	continuous	FWS, CDFG	0.0						
3	4.1	Establish library	continuous	FWS	0.0						
3	4.6	Conduct genetic analyses	2	FWS	20.0		10.0	10.0			
3	4.8	Study relationship of successional habitat	5	FWS, CDFG	50.0		10.0	10.0	10.0	10.0	
3	4.10	Develop protocol for necropsies	1	FWS	2.0	2.0					
3	4.11	Conduct population viability analyses	1	FWS, CDFG	10.0						
3	5.1	Determine feasibility of relocation	1	FWS	0.0						
3	5.2	Plan and conduct relocations	if feasible and needed	FWS	TBD						
3	6.1.1	Develop and implement incentives for recovery	continuous	FWS, CDFG	TBD						
3	6.1.2	Produce outreach materials	1	FWS, CDPR	15.0	15.0					

¹FY1 designates the first fiscal year following approval of the Recovery Plan.

IV. Appendix A: Summary of the Agency and Public Comments on the Draft Recovery Plan for the Point Arena Mountain Beaver

I. Summary of Comments

In July 1997, the Service released the Draft Recovery Plan for the Point Arena Mountain Beaver (Draft Plan) for a 60-day comment period ending on October 20, 1997 for Federal agencies, State and local governments, and members of the public (62 FR 4413). Dr. Paul Beier, Mr. Gordon Gould, and Mr. John Harris were requested to peer review the Draft Plan.

This section summarizes the content of significant comments on the Draft Plan. A total of 11 letters were received, each containing varying numbers of comments. Many specific comments re-occurred in letters.

This section provides a summary of general demographic information, including the total number of letters received from various affiliations and states. It also provides a summary of the eight major comments. A complete index of the commenters, by affiliation, is given in the Section B. All letters of comment on the Draft Plan are kept on file in the Arcata Fish and Wildlife Office.

A. Demographic Information

The following is a breakdown of the number of letters received from various affiliations:

State agencies	4 letters
local governments	2 letters
business and industry	1 letter
environmental/conservation organizations	3 letters
academia/professional	1 letter

B. Reviewers of the Draft Recovery Plan

Dahlhoff, Leslie, City of Point Arena, 451 School Street, P.O. Box 67,
Point Arena, CA 95468

Fellers, Gary, U.S. Department of the Interior, U.S. Geological Survey,
Biological Resources Division, Point Reyes National Seashore, Point
Reyes, CA 94956

Fitts, Kimberley, 5243 Beaumont Way, Santa Rosa, CA 95409

Flowers, Sarah, Department of Parks and Recreation, Russian
River/Mendocino District, P.O. Box 440, Mendocino, CA 95460

Gould, Gordon, California Department of Fish and Game, 1416 Ninth
Street, P.O. Box 944209, Sacramento, CA 94244

Griffin, Jenny, Jenny Griffin Landscaping, P.O. Box 1503, Mendocino,
CA 95460

Hodgson, Ann, Resource Designs, Inc., 1349 S. 101 Street, Suite
304, Omaha, NE 68124

Levine, Alan, Coast Action Group, P.O. Box 215, Point Arena, CA 95468

Northern, Philip, Sonoma State University, School of Natural Resources,
1801 East Cotati Avenue, Rhonert Park, CA 94928

Valentine, Bradley, California Department of Forestry and Fire Protection,
Coast-Cascade Region, P.O. Box 670, 135 Ridgway Avenue, Santa
Rosa, CA 95402

Wooster, Theodore, California Department of Fish and Game, P.O. Box
47, Yountville, CA 94599

II. Summary of Comments and Service Responses

Issue 1: A number of comments were received that contained requests to include additional information such as updated population locations of the Point Arena mountain beaver, additional species of concern, etc.

Response: This new information has been incorporated into the Final Plan.

Issue 2: More surveys need to be done to establish locations of other, new Point Arena mountain beaver populations.

Response: Please see the “Stepdown Narrative”, Task 2.0 of the Final Plan, which is “Survey to locate new populations”.

Issue 3: There is little quantitative support and explanation for, and possibly attainability of, the recovery criteria (downlisting and delisting). Also, for #1, #2 and #3 of the downlisting and delisting criteria, why are the existing populations found along the creeks listed, singled out as being the main populations to be protected?

Response: Recovery criteria have been revised to better reflect existing information based on best knowledge of existing conditions. These criteria may be further revised when new information becomes available. Reference to specific existing populations found along creeks has been deleted from the recovery criteria.

Issue 4: The discussion on “Reasons for Listing and Threats to Survival” contains no substantiation on importance, no plan to address the threats, no determination of importance, and some threats cannot be planned for and are not as catastrophic as suggested.

Response: This section has been revised to better reflect importance of threats and substantiation of threats. Also, some threats which “cannot be

planned for” (e.g., fire), were eliminated from the text. Threats are also discussed in the “Stepdown Narrative” under Task 1.2.

Issue 5: A broad-scale effort should be undertaken to solicit the opinions of the public regarding their perceptions about mountain beavers as pests. Flexible solicitation of public opinions and ongoing public forums to involve and educate the public about the management concerns related to this species is necessary. The Draft Plan proposes an outreach effort which would include the productions and dissemination of educational materials, but may not effectively invoke “ownership” and broad-scale participation by the community.

Response: In the “Stepdown Narrative”, Task 6.0, we have elaborated on this issue.

Issue 6: The Draft Plan reflects a general literature review for the species as a whole, with little regard to the fact that the Point Arena mountain beaver lives in somewhat unusual habitat and in an unusual setting.

Response: The “Habitat” section has been modified to better reflect the literature specifically available on the Point Arena mountain beaver versus other subspecies of mountain beaver.

Issue 7: Elevate task “Survey along drainages for limits of Point Arena mountain beaver” to top priority level.

Response: The U.S. Fish and Wildlife Service cannot consider surveys as Priority 1 tasks (see “Definition of Priorities” given in Section III of the Final Plan). Alone, this task would not prevent the extinction of the species.

Issue 8: At this time, the City of Point Arena and landowners need specific management guidelines from the U.S. Fish and Wildlife Service concerning the Point Arena mountain beaver. A review of Section 5.24 of

the City's Zoning Ordinance, which explains the Mountain Beaver Buffer Area (MBBA), and the special rules that apply to it, need to be reviewed by the U.S. Fish and Wildlife Service for accuracy of the statements regarding the Federal Endangered Species Act and protection measures.

Response: The Sacramento Fish and Wildlife Office has forwarded a copy of the City's Zoning Ordinance, with specific questions from the City of Point Arena about this proposed Ordinance, to the Arcata Fish and Wildlife Office. Due to the location of Fish and Wildlife Offices in the state, and a change in Ecoregion organization since the Recovery Plan for the species was begun, the Arcata Fish and Wildlife Office now has primary responsibility for the Point Arena mountain beaver.

**Region 1
U.S. Fish and Wildlife Service
Ecological Services
911 N.E. 11th Avenue
Portland, Oregon 97232-4181**



June 1998

From: Dean Fernandez <dean@ozfarm.com>
Sent: Friday, March 4, 2022 5:01 PM
To: Santa Rosa Public Comment@CALFIRE
Subject: comments on THP 1-21-00199 MEN

PC4

Warning: this message is from an external user and should be treated with caution.

Greetings,

I am concerned about windthrow, trespassing and runoff that might accrue on your property in regards to the proposed Timber Harvest Plan: THP 1-21-00199 MEN

I am a representative of the Land of Oz, LLC and owner of Oz Farm, LLC which is adjacent to the proposed project.

Thank you for your consideration,

--

Dean Fernandez
Oz Farm, LLC
o:707.882.3046
e: dean@ozfarm.com

RECEIVED

MAR 04 2022

**COAST AREA OFFICE
RESOURCE MANAGEMENT**

From: alevine@mcn.org
Sent: Monday, April 4, 2022 11:30 AM
To: Santa Rosa Public Comment@CALFIRE
Cc: matt@wildcalifornia.org; dahlhoff@mcn.org; HoopArb@aol.com; ldahlhof@mcn.org
Subject: 1-21-00199MEN - Seventh Heaven - Additional comment

PC5

Warning: this message is from an external user and should be treated with caution.

1-21-00199MEN - Seventh Heaven - Additional comment

Coast Action Group has previously submitted comments to this THP.

Subsequent to the submission of those comments a PHI has been performed.

The PHI Reports indicate additional actions need to be accomplished prior to the approval of this plan.

The CDFW PHI calls for additional surveys for plants and terrestrial listed species.

Specifically - CDFW requested a response from the RPF on issues related to the PMB. No response was forthcoming. CDFW notes lack of resources to make determinations regarding presence of PMB colonies and protections that must be applied. This survey and consultation for determinations and actions necessary to protect PMBs must be accomplished by experienced and qualified experts familiar with identification of sites and protection requirements. It is suggested that USFWS staff participate. PMBs are federally listed as Endangered.

There are other similar recommendations for plant and other special status species.

These recommendations are feasible and required for CEQA compliance.

These recommendations must be accepted by the project proponent.

The PMB surveys, and other surveys and applied remedial or protective actions must be disclosed - prior to plan approval. The public and responsible agency must be allowed a complete description of the plan - including the environmental setting and mitigatory process.

Please notify CAG - at this e-mail address - as to the time and place of any planned 2nd review meeting.

Thank you

Alan Levine, for Coast Action Group

126 Steiner Ct
Santa Rosa, CA 95404

(707) 542-4408

RECEIVED**APR 04 2022****COAST AREA OFFICE
RESOURCE MANAGEMENT**

From: alevine@mcn.org
Sent: Wednesday, June 15, 2022 11:08 AM
To: Santa Rosa Public Comment@CALFIRE
Subject: THP 1-21-00199 MEN – Garcia River (Seventh Heaven)
Attachments: 1-21-000199-MEN (Additional Information) Seventh Heaven.docx

PC6

Warning: this message is from an external user and should be treated with caution.

Dear Calfire

THP 1-21-00199 MEN – Garcia River (Seventh Heaven) has been re-circulated

The public comment period for THP 1-21-00199-MEN “Seventh Heaven THP” has been reopened. Please see attached document for details. Please continue to send all correspondence regarding timber harvesting plans to SantaRosaPublicComment@fire.ca.gov

I tried to submit these additional comments via Caltrees. Caltrees did not have this re-circulated plan on their list of plans available for comment.

These comments are not new - they are a clarification/re-phrasing of language previously submitted in comments on this plan.

Please acknowledge receipt of these comments.

Alan Levine, for Coast Action Group

RECEIVED**JUN 15 2022****COAST AREA OFFICE
RESOURCE MANAGEMENT**



COAST ACTION GROUP
P.O. BOX 215
POINT ARENA, CA 95468

June 15, 2022

Affiliate of Redwood Coast Watersheds Alliance

Calfire and Review Team Agencies

Subject: Comments 1 – 21 - 00199 MEN – Garcia River (Seventh Heaven)

This document is submitted, upon re-circulation of this plan, to add to/clarify information in previously submitted comments (included below) by Coast Action Group. This is not new information. These comments are clarification of previous submitted comments.

At issue is application of Garcia River TMDL requirements – and the sufficiency of stated SSMP that the plan relies on for TMDL compliance and CEQA required disclosure of complete project description, environmental assessment, and feasible mitigations necessary to limit potential impacts of the project – all aspects of the CEQA intended as “informed decision making process”.

Factual basis in evidence:

The Director must disapprove a plan the is not consistent with the applicable Water Quality Control Plan (Basin Plan). (FPR 898,2)

An approved THP must be consistent with an approved TMDL (FPR 916.9 (a) (1)

The Garcia River TMDL for Sediment has specific prescriptive operational language for timber operations.

The Garcia River TMDL for Sediment allows for application of a Site Specific Management Plan (SSMP) with different operational language to be used, in-lieu, of the prescriptive language, if the approved SSMP is “roughly equivalent” to the existing prescriptive language. Such SSMP has specific requirements (specific requirements are listed in the Appendix - below). Additionally; the SSMP and the THP must be consistent with Basin Plan requirements – including the Non-point Source Policy requirements (noted in comments below – where compliance with same is manifest in the FPRs – as noted above).

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JUN 15 2022

**COAST AREA OFFICE
RESOURCE MANAGEMENT**

Conditions/Issues in this THP regarding compliance with the above noted Factual Basis (above):

The SSMP is incomplete or invalid:

No history or assessment or validation of the constituents necessary or evident in the approval process of the SSMP. The SSMP (including all information in the Record) is lacking many of the requirements necessary for an approved SSMP (iterated in the Basin Plan and the Appendix – below). And, in fact, the missing elements are required, not only for SSMP approval and application, the missing elements are necessary (under CEQA) for project review – and, thus, must be part of the plan (this also is inclusive of necessary elements of the Basin Plan – Non-point Source elements – that are also absent from the plan).

Conclusion

Compliance with the Directors responsibility to approve or disapprove a plan (under the FPRs) requires the missing data and information necessary for SSMP approval, and plan approval, either the missing information and data must be supplied (as part of the plan), or the plan must be disapproved.

Compliance with CEQA required missing data and information necessary for SSMP approval as well as providing CEQA required available information and data for environmental analysis and the “informed decision making process” must be supplied (as part of the plan) – or the plan must be disapproved.

Until SSMP (inclusive of all necessary elements) and Basin Plan Non-point Source Policy requirements (in the Basin Plan) are made part of the plan - application of Garcia TMDL for Sediment prescriptive language for the protection of Class II (including Class IIs) and Class III watercourses must be applied to operations proposed in this THP (due failure to disclose pertinent information as necessary conditions for SSMP and/or plan approval – as compliance with the plain language in the Garcia TMDL for Sediment (included in the Basin Plan)).

This THP may not be approved (the Director must disapprove) a plan that is not consistent with the applicable Water Quality Control Plan (Basin Plan – inclusive of TMDL requirements, SSMP requirements, and Non-point Source policy). The Director must observe the plain language in the Garcia River TMDL and Implementation Plan (with prescriptive language for timber operations – and requirements for an SSMP. Additionally, all related pertinent information must be part of the plan.

Previously submitted comments (included below)

Garcia River watershed (inclusive of tributaries noted in the plan) are listed on the State of California List of Water Quality Limited Segments (303 (d) list) – for pollutants sediment and temperature. This THP must acknowledge this impaired condition, by both pollutants, and demonstrate how the plan is in compliance with the standards required by the Garcia River

TMDL and Basin Plan. Basin Plan language states that all controllable pollutants (active and potential sources) will be controlled (absolutely limited) under operations described in the plan. This responsibility commences with an accurate description of the plan, watershed conditions, and actions required and taken to control all existing/active and potential pollution sources by use of narrative/descriptive language, maps, charts, inventories, and monitoring data. Description and analysis provided must be inclusive of historic activity that has affected the watershed and the area in the plan.

It is noted in the plan that a SSMP is being applied, in-lieu of and supplementing the prescriptive standards set forth in the Garcia TMDL for Sediment (Implementation Plan) – i.e. ASP protections are being applied to Class IIs and Class III watercourses.

The plan does not note Garcia River TMDL requirement of an Erosion Control Plan (inclusive of inventory and time scheduled remediation of all existing and potential sediment sources). This is required by the Basin Plan and Non-point Source Policy which includes mandates for robust implementation and effects monitoring (controlling all controllable sources of pollutants). Please demonstrate compliance with these issues in the plan.

Extended Wet Weather Operations. Due to erosion potential during these extended wet weather periods operations should be strictly limited. Such controls are not evident in the plan. See- Garcia River TMDL/Basin Plan and Non-point Source Control management criteria. The SSMP provided: 1) is not consistent with previous boxes marked No in the above sections, 2) does not provide adequate assessment and control of pollutant sources (inclusive of the pollutants sediment and temperature).

Included in the plan area are numerous erosion sites that should have been corrected previously, as part of previous harvest operations. This is a criticism of previous Review Team management of this ground under the auspices of the Garcia River TMDL and Basin Plan requirements. The Review Team needs to be more on top of these erosion control and thermal management issues. What happened with previously mandated implementation and reporting? This is evidence of ongoing erosion where the plan calls for some repairs that should have previously been implemented. It also demonstrates the need for application of protection measures of all controllable and potential sources along with specific monitoring controls to assure compliance.

Water Course Protection measures. This section notes the existence of the Garcia TMDL, which includes specific watercourse protection criteria. In this case both ASP and the Garcia TMDL watercourse protections apply as base line criteria for protections. That is the greater protection of either ASP or the TMDL must be applied. Stated in the TMDL (Basin Plan): *“no commercial land management activities, including commercial or salvage timber harvest, grazing or crop agriculture, within the first 25 feet of the Riparian Management Zone for Class I or II watercourses.”* This applies to all Class I and Class II watercourses (inclusive of Class IIs)

in addition to the ASP language. The TMDL language makes no differentiation between Class IIL and Class IIS in the Garcia River TMDL.

Additionally: “On Class I and II watercourses, at least five standing conifer trees greater than 32 inches in diameter at breast height (DBH) are permanently retained at any given time per 100 linear feet of watercourse. Where sites lack enough trees to meet this goal, there shall be no commercial harvest of the five largest diameter trees per 100 linear feet of watercourse.”

And:

“There is no removal of trees from unstable areas within a Riparian Management Zone that have the potential to deliver sediment to a water of the State unless the tree is causing a safety hazard.”

The above is to be applied in addition to ASP

Site Specific Management Plan (SSMP) Validity and Application: In part, erosion control practices in this THP rely on a SSMP. However, the SSMP is not applicable – due to: Necessary elements of an SSMP are not extent. A partial list of SSMP required measures not included are: 1) Long term Road System Management Plan for all properties in the Garcia River, 2) Supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding measures of the Garcia River Management Plan, 3) Description of Land Management Measures to Improve the Condition of the Riparian Management Zone, 4) The Site- Specific Management Plan shall include a description of, and schedule for, the Land Management Measures and any restoration activities the landowner proposes to improve or maintain the condition of the Riparian Management Zone such that it provides:

- Stream bank protection,
- Filtering of eroded material prior to its entering the watercourse channel, and
- Recruitment of large woody debris to the watercourse channel and flood plain.

In addition, the description shall include supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding riparian measures of the Garcia River Management Plan.

The above standards applied to the SSMP indicate (elements demonstrated in the THP including: improper stream classifications and protections, failure to address temperature issues, failure to meet mandated SSMP constituents, etc.) that the applicability of the SSMP and/or applied measures in the THP fail to meet the regulatory standard. Also indicated is the need for more

robust standards and controls. Furthermore, such SSMP as part of a permitting apparatus under regulatory structure must be provided to the public and other responsible agency as part of review and approval process. Noticing this SSMP for review has not occurred. Note: All policy and plan development in the Basin Plan is subject to public noticing and review.

The THP, and related SSMP, are not consistent with Non-Point Source Policy in the Basin Plan. This THP, and related SSMP, cannot be approved, nor can it be adopted into the General WDR for Timber Operations on Private Lands until consistency with the Basin Plan (all related elements) is attained. Note: FPR 898.2 Special Conditions Requiring Disapproval of a plan: *‘Implementation of the Plan as proposed would cause violation of any requirement of an applicable water quality control plan (Basin Plan) adopted and approved by the State Water Resources Control Board’* This criteria also applies to damage to listed species and their habitat.

The THP Water Course Protections noted in the plan are incorrect and need to be revised.

Reliance of application of an SSMP, and Basin Plan and State Water Code requirements includes submission of data (stream temperature monitoring, stream condition monitoring, with trend measurement and assessment of how applied, and proposed, management considerations are actually working, or are intended to work – limiting pollutant inputs as noted in the TMDL source reduction targets.

Note: Review of the SSMP in Section 3 indicates many commendable actions. However, there are missing necessary elements and protections required for the adoption of the SSMP (see requirements in Appendix). Nor...has any analysis, or data, been provided to support that the SSMP is sufficient, or equivalent to the prescriptions in the Garcia River TMDL and Implementation Plan. These issues can be remedied with some additional work.

Furthermore; this plan does not meet CEQA requirements for full description of the plan and analysis to support the "Informed Decision Making Process" - due to the absence of information and data required by the Basin Plan Non-point Source language and details and requirements of an SSMP - which all must be part of the plan.

The discussion of pollution control in the plan contains no such evidence as described above.

Forest Practice Rules (in the context of the above noted information:

Section 898.2 Special Conditions Requiring Disapproval of Plans – Implementation of the plan as proposed would result in either a “taking” or a finding of jeopardy of wildlife species listed as rare, threatened, or endangered by the Fish and Game Commission, the National Marine Fisheries Service, or the Fish and Wildlife service, or would cause significant, long-term damage to listed species. Additionally, a plan must be disapproved if there is evidence that the information in the plan is incorrect, incomplete, or misleading in a material way, or is insufficient to evaluate significant environmental effects.

Due to the factual basis: The Director must disapprove of a plan that is not consistent with the Basin Plan, and 916.9 (a) (1) of the FPRs states that a plan must be consistent with an approved TMDL – and where the basic requirements of approving and applying a SSMP have not been met, this plan may not be approved without applying the Garcia River TMDL Implementation plan prescriptive measures for stream protection. Calfire must follow the exact wording of the Garcia TMDL and the application of the FPRs for plan approval or disapproval.

I look forward to agency review and your response.

Alan Levine , for Coast Action Group

APPENDIX

Site Specific Management Plan (requirements – from Garcia TMDL Implementation – Basin Plan)

Elements of a Site-Specific Management Plan

1. Description of Land Management Measures to Control Sediment Delivery

A Site -Specific Management Plan shall include a description of, and schedule for, the Land Management Measures the landowner proposes to implement to control the future delivery of sediment from the following land management activities:

- Roads, landings, skid trails, watercourse crossing construction, reconstruction, maintenance, use, and obliteration;
- Operations on unstable slopes;
- Use of skid trails and landings;
- Use of near stream facilities, including agricultural activities; and
- Gravel mining.

In addition, the description must include:

- A Long-term Road System Plan (Road Plan) similar to that described below in the Garcia River Management Plan, and

- Supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding measures of the Garcia River Management Plan.

2. Description of Land Management Measures to Improve the Condition of the Riparian Management Zone

The Site- Specific Management Plan shall include a description of, and schedule for, the Land Management Measures and any restoration activities the landowner proposes to improve or maintain the condition of the Riparian Management Zone such that it provides:

- Stream bank protection,
- Filtering of eroded material prior to its entering the watercourse channel, and

- Recruitment of large woody debris to the watercourse channel and flood plain.

In addition, the description shall include supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding riparian measures of the Garcia River Management Plan.

B. Nonpoint Source Policy

Many water bodies in the North Coast Region are impaired by nonpoint sources (NPS) of pollution, such as sediment discharges and elevated water temperatures. Therefore, many of the following TMDL action plans focus on NPS pollution control.

The Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy) is a state-wide policy that explains how existing permitting and enforcement tools will be used to address nonpoint sources of pollution. The NPS Policy states that all current and proposed NPS discharges must be regulated under waste discharge requirements (WDRs), waivers of WDRs, a basin plan prohibition, or some combination of these tools.

A NPS pollution control implementation program is a program developed to comply with WDRs, waivers of WDRS, or basin plan prohibitions. A NPS pollution control implementation program must contain five key elements, which are summarized as follows:

Key Element 1: Explanation of the purpose of the NPS pollution control implementation program and how it will meet water quality standards.

Key Element 2: Description of the management practices and other program elements that are to be used to meet water quality standards and an evaluation that ensures proper implementation.

Key Element 3: A time schedule with quantifiable milestones.

Key Element 4: Adequate monitoring.

Key Element 5: The potential consequences for failure.

UNIT, ER, RPF, CaIT, A

1-21-00199-MEN

22PC-0000000078
PC7

Attn: Forest Practice
California Department of Forestry and Fire Protection
135 Ridgway Ave.
Santa Rosa, CA. 95401

June 19, 2022

Re: Seventh Heaven THP, Point Arena CA.

To Cal-Fire, Forest Practice,

I own property adjacent to this proposed THP yet I never received a notice. A neighbor brought it to my attention this week. My property, purchased in 2021, is listed as 41141 Harris Ranch Road, Point Arena, CA. APN# is 027-171-15-00. The proposed THP wraps around my property on the north and the east sides so will have considerable impact.

Please note the following corrections or concerns pertaining to this THP being filed by Roger A. Burch and Michele Burch of the RMB Revocable Family Trust Dated February 5, 1999.

1. I am sending you a copy of the property map, showing the well/water system marked with an X near the northern center of the lot.
2. I purchased this property as habitat protection, and would like to request a buffer of no timber harvesting on a band along the eastern edge of my property to protect a dense stand of redwood and fir trees. My concern is that winds could be increased, leading to damage in my portion of the forest, if the proposed "Seventh Heaven" timber harvest removes the protective large trees next to my property line, which runs through the middle of the forest. I have marked this requested buffer area with an orange hatched line.
3. In addition, I want to bring to your attention the presence on my property of a rare and threatened flower, the coastal lily, *Lilium maritimum*. This lily has a rare plant ranking of 1B.1 and only grows in a limited area of the North coast now. It may be present in the proposed THP as well, and should be protected.
4. Also of concern— the red tree vole— reportedly seen in the area, requires the presence of old-growth and mature Doug firs for its existence. I notice that a number of large Doug firs are marked for removal. Has a biological study been done for this THP?
5. I have power lines on my property which come from the adjacent property marked for Seventh Heaven THP, yet I don't see them marked on your map.
6. Please add me as a property owner (mailing address below), and review and address these concerns before doing logging in this area. Thank you.

Sincerely,

Robin Applegarth
Robin Applegarth

Mailing address:
35501 S. Hwy. 1, Unit 109
Gualala, CA. 95445

Attachments: parcel map with well and buffer request, and landowners list with correction

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JUN 23 2022

COAST AREA
RESOURCE MANAGEMENT

PC7

Seventh Heaven THP

Landowners within 300' of the THP

Orbrad and Maura Darbro 308 Playa Blvd #F Watsonville, CA 95076	
Timothy Corey PO Box 298 Gualala, CA 95445	
Kirk Handley PO Box 157 Elk, CA 95432	
Rhonda Lopus 27650 Asti Road Cloverdale, CA 95425	
Tobias Green PO Box 603 Point Arena, CA 95468	
Charles Lovelace 3750 Eugene St Fremont, CA 95438	
Lester Meu 647 Mariposa Ave. Oakland, CA 94610	New Owner: Robin Applegarth as of 12-21 35501 S. Hwy. 1 Unit 109 Gualala, CA 95445
Barbara Dyche 40480 Garcia River Rd Point Arena, CA 95468	
Rebecca and James Neal PO Box 416 Point Arena, CA 95468	
William Clement PO Box 1049 Point Arena, CA 95468	
John Herrmann PO Box 637 Point Arena, CA 95468	
Scott Cowan 40280 Garcia River Rd Point Arena, CA 95468	
Karl Mellander PO Box 948 Point Arena, CA 95468	
James Eulie PO Box 635 Point Arena, CA 95468	PO BOX 635 LAYTONVILLE, CA 95454
The Conservation Fund 1655 N Fort Myer Dr #1300 Arlington, VA 22209	
Alicia Galliani 11560 East Rd	

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JUN 23 2022

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JUN 02 2022

COAST AREA
RESOURCE MANAGEMENT

RECEIVED

JAN 31 2022

COAST AREA OFFICE
RESOURCE MANAGEMENT






41141 Harris Ranch Rd.
Pt. Arena

Harris Ranch Rd.





Hathaway Creek

Buckridge Rd.

Legend

-  Property Boundary
-  Non-Timbered Area
-  Building
-  Watercourses
-  Domestic Water Intake

Road Classification

-  Public
-  Permanent
-  Existing Seasonal
-  Skid Trail

Harris Ranch Road Property General Topography Recon Map

Portions of Section 5
T12N; R16W MDB&M
Point Arena, CA 7.5' USGS Quad

40 ft Contour Interval
1:6,000 1in = 500 ft



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JUN 23 2022

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RESOURCE MANAGEMENT

*The closest NSO ACs are MEN0356 0.75 miles northwest and MEN0006 0.95 miles west of the property.